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Part II

Water Resources Council

Proposed Rules; Principles, Standards, and Procedures for Planning Water and Related Land Resources

WATER RESOURCES COUNCIL

18 CFR Parts 710, 711, 713, 714 and 716

Principles, Standards, and Procedures for Water Resources Planning

AGENCY: U.S. Water Resources Council.

ACTION: Proposed Rules.

SUMMARY: The Water Resources Council proposes to publish rules for water resources planning, pursuant to the Water Resources Planning Act of 1965 (42 U.S.C. 1962 et seq.). The intent of these rules is to ensure consistency and accuracy among Federal agencies in water resources planning.

DATES: Comments are due on or before June 13, 1980. See Supplementary Information for dates of public meetings.

ADDRESS: Interested persons are invited to submit written comments to the Director, U.S. Water Resources Council, 2120 L Street NW., Washington, D.C. 20037. All written comments made pursuant to this notice will be available for public inspection at the address given above. See Supplementary Information for addresses of public meetings.

FOR FURTHER INFORMATION CONTACT: Frank H. Thomas, U.S. Water Resources Council, telephone 202/254–6453.

SUPPLEMENTARY INFORMATION:

Authority

The Water Resources Planning Act of 1965 directs the Water Resources Council to establish "principles, standards, and procedures for Federal participants in the preparation of comprehensive regional or river basin plans and for the formulation and evaluation of Federal water and related land resources projects." (42 U.S.C. 1962a–2)

The Act also authorizes the Council to "make such rules and regulations as it may deem necessary or appropriate for carrying out those provisions of this Act which are administered by it." (42 U.S.C. 1962d–1)

Section 102(2)(B) of the National Environmental Policy Act of 1969 requires Federal agencies to "identify and develop methods and procedures * * * which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations." (42 U.S.C. 4332) This requirement for Federal agencies is also included in the Council on Environmental Quality's Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (40 CFR 1507.2(b)).

Background

The Principles and Standards for Planning Water and Related Land Resources were published as a Notice in the **Federal Register** on September 10, 1973 (38 FR 24778). The Standards were amended on August 14, 1974 (39 FR 29242) pursuant to the provisions of Section 80 of the Water Resources Development Act of 1974 (42 U.S.C. 1962d–17).

On July 12, 1978, the President issued a directive titled "Improvements in the Planning and Evaluation of Federal Water Resources Programs and Projects." This directive requires the Water Resources Council to prepare a planning manual to ensure accuracy and consistency in Federal water resources programs and projects. The President also directed the Council to modify the 1973 Principles and Standards to: accomplish the full integration of water conservation into project and program planning and review, as a component of both the economic development and environmental quality objectives; and require the preparation and inclusion of a primarily nonstructural plan as one alternative whenever structural project and program alternatives are considered.

On January 5, 1979, additional direction was given by the President in Excecutive Order 12113 (44 FR 1955), which directed the Council to ensure that it has established a current set of principles, standards, and procedures.

On December 14, 1979, the Water Resources Council adopted and published Procedures for Evaluation of National Economic Development (NED) Benefits and Costs in Water Resources Planning as a final rule, 18 CFR Part 713 (44 FR 72892). Also, on December 14, 1979, the Principles and Standards were revised (44 FR 72978) to incorporate policies on water conservation and nonstructural measure considerations.

Part 710 of the proposed rules states the principles for the following three levels of planning: (1) Level A—framework studies and assessments; (2) Level B—regional and river basin studies that lead to a recommended plan; and (3) Level C—implementation studies. Part 711 of the proposed rules includes both the principles and standards for Level C planning. The principles are integrated with the standards for Level C planning to provide a coherent statement of principles and standards. Standards for Level B planning will be prepared by the Water Resources Council at a future date.

The rules being proposed include only part of the Federal water resources planning procedures being prepared by the Water Resources Council at the direction of the President. In addition to the December 14, 1979, NED Procedures (Part 713) and these proposed rules, other efforts will be directed toward development of procedures for plan formulation (Part 712), supplemental EQ procedures, (Part 714) development evaluation procedures for regional economic development (Part 715), and preparation of the remainder of evaluation procedures for other social effects (Part 716). It is anticipated that this additional work could begin about October 1980.

General Discussion: Part 710—Principles for Planning Water and Related Land Resources, and Part 711—Principles and Standards for Planning Water and Related Land Resources (Level C).

Agencies have experienced difficulty in implementing the September 10, 1973, Principles and Standards. Revisions are needed for clarity and conciseness, to make the Principles and Standards more understandable, and to achieve consistency in their application.

The President's June 6, 1978, message called for the reduction of duplication and inconsistency in policies and less "red tape" to implement Federal program requirements and plans. In view of this, and while addressing the need to incorporate the requirements of Executive Order 12074, Urban and Community Impact Analysis (3 CFR 217) in the Principles and Standards, the Water Resources Council, at its meeting on December 20, 1978, decided that revisions of the Principles and Standards should incorporate the requirements of Urban and Community Impact Analysis along with the requirements of other impact analyses. The Council has also recognized the need to integrate into the Principles and Standards, the requirements of the Council on Environmental Quality's Regulations for implementing the provisions of NEPA (40 CFR Parts 1500–1508).

The intent of these proposed rules (Part 710 and Part 711) is to: revise the principles and standards to be current, clear, and concise; incorporate appropriate consideration for urban and community impact analysis; and incorporate the appropriate requirements of the National Environmental Policy Act and regulations established by the Council on Environmental Quality in 40 CFR Parts 1500–1508. The proposed rules are

not intended to modify the basic concepts of the 1973 Principles and Standards (as revised).

General Discussion: Part 713—Procedures for Evaluation of National Economic Development (NED) Benefits and Costs in Water Resources Planning (Level C).

During the preparation of the December 14, 1979, Procedures for Evaluation of National Economic Development (NED) Benefits and Costs in Water Resources Planning (18 CFR Part 713), procedures for deep draft navigation and commercial fishing were deferred for further development. These procedures have now been prepared as Subparts J and L of Part 713. Benefits to commercial trapping, which had been considered, are not included because Federal water resources plans have little impact on commercial production of furbearing animals.

The Council also proposes to amend Subpart A to state that the applicability of Subparts J and L will be at the discretion of the Secretaries of Departments through fiscal year 1981.

General Discussion: Part 714 Environmental Quality (EQ) Evaluation Procedures for Level C Water Resources Planning.

The intent of these proposed procedures is to ensure consistency and accuracy among agencies in the analysis of beneficial and adverse environmental quality (EQ) effects of alternative plans for water and related land resource development.

In developing these procedures it is recognized that the state of the art for analysis of EQ effects has not matured to the point where acceptable, specific, quantitative measurement and evaluation techniques could be adopted as requirements. Therefore, the Council intends to further investigate the development of such techniques, and will supplement these procedures with specific, acceptable, valid techniques as they become available.

Public comment is invited on all aspects of these procedures. Specific comments on the following issues would be of particular assistance:

A. A concept of EQ value is used as a basis for defining the quality of resources. The EQ values identified in the draft procedures are: ecological, aesthetic, historic, educational/scientific, and pristine values (see § 714.350). Is this a valid approach to defining resource quality? If so, what values, if any, should be added to or dropped from this set?

B. The procedures present a process for evaluating effects of alternative plans on EQ resources. The process is performed in four phases: scoping, inventorying, assessment, and appraisal (see Subpart D). Is this process a proper focus for EQ evaluation procedures? If not, what would you propose? For example, would a different outline, such as one focused on EQ values or one focused on administrative classes of resources (as listed in column 1, Table 714.410–1) be a better basis for EQ evaluation procedures?

C. Paragraph 714.410(a)(3) presents criteria for identifying resources to be evaluated in addition to federally recognized resources listed in Table 714.410–1. The criteria are: location in study area; likelihood of being affected; possession of material EQ value; and significance based on institutional, public, or technical recognition. Is this a valid set of criteria for identifying such resources? If not, what criteria should be used?

D. Techniques for measuring and forecasting the quantity and quality of EQ resources are generally described, but their use is not specifically required (see §§ 714.410(b)(3) and 714.420(b)(4) and (c)(3)). Should other techniques be included? If so, what techniques should be added? Should the use of any specific techniques be mandated at this time?

E. The appraisal of significant effects as either beneficial or adverse is based on a comparison of future resource conditions with and without plans, to guidelines (see § 714.440(a)). Is this use of guidelines a valid approach to determining the desirability of effects? If not, what approach should be used?

F. The determination of the net EQ effect of an alternative plan is based on the judgment of the agency decisionmaker. However, no specific techniques to facilitate this judgment have been provided. Can you recommend any techniques or alternative approaches that would be useful in determining net EQ effect?

G. EQ effects are often evaluated in terms of descriptive categories, such as enhancement, improvement, conservation, preservation, protection, creation, and restoration. This approach has not been included in these procedures due to the apparent lack of a comprehensive set of categories, and clear, acceptable definitions for categories. Should a set of such categories be included in these procedures? If so, what function should they perform in EQ evaluation; what categories should be included; and what are the differences among the categories that should be included?

General Discussion: Part 716—Procedures for Evaluation of Other Social Effects in Level C Water Resources Planning: Subparts A and E.

One of the items addressed in the President's Directive of July 12, 1978, was the "consideration and display of engineering uncertainty" associated with Federal water resources projects. A proposed procedure for evaluating the cost of possible dam failure was included in the proposed rules for the National Economic Development (NED) Procedures (44 FR 30198) but it was not published as a final rule under 18 CFR 713. The issue of assignment of a probability of failure to individual dams to calculate an expected cost of dam failure for inclusion in the NED Procedures remains unresolved.

In responding to the President's Directive to consider and display engineering uncertainty, the proposed procedure calls for the estimation and display of the adverse effects of dam failure in the Other Social Effects (OSE) account. Since average annual monetary values are not required in the OSE account, effects of a potential dam failure can be described without regard to the probability of occurrence.

Public Meetings

Public meetings on all Parts of the proposed rules will be held as follows:

May 20—9 a.m. to 5 p.m., Federal Building, Room 140, 601 East 12th Street, Kansas City, MO 64106.

May 23—9 a.m. to 5 p.m., United States District Court, Ceremonial Courtroom, 19th Floor, 450 Golden Gate Avenue, San Francisco, CA 94102.

May 29—9 a.m. to 5 p.m., Lower Level Conference Room, U.S. Water Resources Council, 2120 L Street, NW., Washington, DC 20037.

The amount of time for oral statements during the meetings will be limited. Anyone planning to make a statement should write or telephone Peggy Kilburn, Water Resources Council, 2120 L Street, N.W., Washington, DC., 20037, (telephone 202/254–6453) and indicate which meeting will be attended and the time of day preferred. The Council will schedule the time as closely as possible to that requested and will notify speakers as to the time allotted.

Finalization of Rules

This publication represents the beginning of a 60-day review to receive input from all interested persons. After public review and comment has been obtained and after consultation with the Member agencies of WRC, it is intended that final rules will be developed.

Required Analyses

These proposed rules have been determined to be significant under

Executive Order 12044, and a draft regulatory analysis has been prepared.

Based on an environmental assessment, prepared in accordance with 40 CFR 1500–1508, the Director of the Council has determined that these proposed rules will not significantly affect the quality of the human environment, and signed a finding of no significant impact.

Copies of the combined draft regulatory analysis and environmental assessment, and the finding of no significant impact may be obtained from the Director, U.S. Water Resources Council, 2120 L Street, NW., Washington, DC, 20037.

Leo M. Eisel,

Director.

Proposed Rules

It is proposed that the Code of Federal Regulation, Title 18, Chapter VI be amended as follows:

1. By adding a new Part 710 to read as follows:

PART 710—PRINCIPLES FOR PLANNING WATER AND RELATED LAND RESOURCES

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710.120 National programs.

Authority: Sec. 103 and 402, Pub. L. 89–80, 79 Stat 245 (42 U.S.C. 1962a–2 and d–1).

Subpart A—Introduction

§ 710.1 Purpose.

These Principles establish rules to be followed by the Water Resources Council (WRC) and WRC-designated agencies in planning Federal and Federally-assisted water and related land resource programs and projects. Their purpose is to establish uniformity in water and related land resources planning. They provide the basic policy for the Standards and the Procedures.

§ 710.2 Scope.

(a) These Principles cover water and related land resources planning. They establish the basic process to be followed by river basin commissions and Federal agencies and specify how each phase of the process is to be performed.

(b) The national objectives and accounts covered by these Principles incorporate and are consistent with the concept of human environment as used in the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321–4361) and the appropriate portions of the NEPA process regulations established by the Council on Environmental Quality (CEQ) in 40 CFR Parts 1500–1508.

§ 710.3 Authority.

These Principles are established as rules pursuant to the Water Resources Planning Act of 1965, (Pub. L. 89–80) as amended (42 U.S.C. 1962a–2 and d–1). These Principles supersede the *Principles for Planning Water and Related Land Resources,* 38 FR 24781–24788, September 10, 1973, and revisions in 44 FR 72978–72980, December 14, 1979.

§ 710.4 Applicability.

(a) These Principles apply to the following three levels of Federal Water and related land resources planning as defined by WRC:

(1) *Level A—framework studies and assessments.* Level A planning studies are broad-based evaluations or appraisals designed to ascertain the desirability of conservation, development, and utilization of water and related land resources. These studies identify problems and opportunities in the nation, regions, river basins, and specific areas.

(2) *Level B–regional and river basin studies that lead to a recommended plan.* Level B planning studies are planning efforts to provide input to, or be adopted as, comprehensive, coordinated water resources plans, or portions thereof, for regions or river basins. Level B studies include strategies, policies, and programs which provide a basis for detailed studies and actions leading to implementation of Federal, State, and local government programs. Comprehensive studies specifically authorized by the Congress are to be carried out to the extent necessary to fulfill their statutory requirements.

(3) *Level C—implementation studies.* Level C studies are program or project feasibility studies generally undertaken by a single Federal agency and which are expected to result in project authorization, funding, and implementation. These studies are conducted in response to findings and conclusions identified in assessments and regional and river basin studies, or in direct response to national, or local problems and opportunities.

(b) These Principles are to be implemented by WRC and are to be applied by river basin commissions, WRC-designated Federal-State organizations, compact commissions for studies funded by WRC, and WRC-designated Federal agencies.

(c) The Chairman of WRC, the Chairman of a river basin commission, the Secretary of a department, and the head of an independent agency shall retain the discretion to exempt studies for which planning is complete or will be complete by the end of FY 1981.

(d) Authorized projects exempted from complying with the Principles and Standards of September 10, 1973 are exempt from complying with these Principles.

(e) These Principles shall take effect 30 days from the date of their publication in the **Federal Register.**

Subpart B—General Planning Considerations

§ 710.11 General setting—projections.

(a) Formulation and evaluation of alternative plans are to be based on the most likely conditions expected to exist in the future with and without the plan. The projection of with- and without-plan conditions is to be based on national and regional projections of income, employment, output, population, and land use trends, the amounts of goods and services likely to be demanded, and expected environmental conditions. The without-plan condition is the condition expected to prevail in the absence of any alternative plan in the study and is the same as the alternative of taking no action.

(b) National projections used in planning are to be based on a reasonably full employment economy. This does not preclude consideration of special analyses of regions with high rates of unemployment and underemployment in calculating benefits from using unemployment and underemployed labor resources.

(c) It is important to maintain conceptual, methodological, and geographical consistency in regard to projections among Level A and Level B planning studies. To accomplish this, national/regional projections of population and economic activity are prepared for and published by the WRC. These projections are to be the basis for establishing the with- and without-plan conditions unless it is determined by the planner that these projections are not appropriate. If these projections are not appropriate, the planning report will contain an explanation as to why the plan has been based on other projections.

§ 710.12 Scoping.

Planning is to include an early and open process termed "scoping" to identify both the likely significant issues and the range of issues to be addressed. Scoping is to be used as appropriate throughout planning to ensure that all significant decisionmaking factors are addressed.

§ 710.13 Public participation.

Interested and affected agencies, groups, and individuals are to be provided opportunities to participate throughout the planning process. The responsible Federal planning agency is to contact: other Federal agencies; the governors or State agencies responsible for water planning; appropriate regional, State, and local agencies; national, regional, and local groups; and individuals to solicit their participation. A joint public participation program should be established with willing agencies and groups.

§ 710.14 Period of analysis.

The period of analysis is to be the same for all effects being evaluated. The period of analysis is to be the lesser of—

(a) The period of time over which the plan would serve a useful purpose; or

(b) A period not to exceed 100 years.

§ 710.15 Risk and uncertainty—sensitivity analysis.

(a) Situations of risk are defined as those in which the potential outcomes can be described in reasonably well known probability distributions. Some types of risks, such as the probability of particular flood damages, are to be incorporated in the planning and evaluation procedures. In situations of uncertainty, potential outcomes cannot be described in objectively known probability distributions.

(b) Risk and uncertainty arise from measurement errors and from the underlying variability of complex, natural, social, and economic situations. Methods of dealing with risk and uncertainty include:

(1) Collection of more detailed data to reduce measurement error.

(2) Use of more refined analytic techniques.

(3) Increasing safety factors in design.

(4) Selection of measures with better known performance characteristics.

(5) Reducing the irreversible or irretrievable commitments of resources.

Reducing risk and uncertainty may involve increased costs or loss of benefits. The advantages and costs of reducing risk and uncertainty are to be considered in the planning process.

(c) Plans should be examined to determine the uncertainty inherent in the data or various assumptions of future economic, demographic, environmental, and technological trends. Reasonably probable projections that would, if realized, appreciably affect plan design should be analyzed.

(d) The planner's primary role in dealing with risk and uncertainty is to identify the areas of sensitivity and describe them clearly so that decisions can be based on the best available information.

§ 710.16 Discount rate.

The discount rate to be used for the formulation and economic evaluation of plans for water and related land resources will be published by the Water Resources Council at the beginning of each fiscal year. The rate will be determined in accordance with § 704.39 of this chapter.

§ 710.17 Relative prices and general price levels.

(a) Relative price relationships for outputs and inputs prevailing during or immediately preceding the period of planning are generally to be used to represent the price relationships expected over the period of analysis, unless specific considerations indicate that other assumptions should be made. Exceptions to the general rule will occur if real exchange values are expected to change over the period of analysis.

(b) The general level of prices for outputs and inputs prevailing during or immediately preceding the period of planning are to be used to represent the prices expected over the period of analysis, except to the extent that the real value of specific outputs or inputs is expected to change.

(c) It is recognized that the relationships between monetized and non-monetized values may change over the period of analysis. Any assumption of change is to be documented.

§ 710.18 Review and consultation.

Review and consultation with interested and affected agencies, groups, and individuals are required in the planning process. Reviews are to be consistent with the requirements of the NEPA process (40 CFR Parts 1500–1508). The NEPA process and the planning process described in these Principles are complementary.

§ 710.19 Interdisciplinary planning.

Planning is to use an interdisciplinary approach that will ensure the integrated use of the natural and social sciences and the environmental design arts.

§ 710.20 Ground water.

Planning studies are to give appropriate consideration to any ground water problems in the study area and the effects of the alternative plans on ground water resources.

§ 710.21 Instream flow.

Within the scope of the planning process, the responsible planning agency is to determine and consider instream flow needs relevant to the planning setting.

§ 710.22 Documentation.

Planning studies are to be documented in a clear, concise manner.

§ 710.23 Federal-State relationship in planning.

The responsible Federal planning agency or river basin commission is to contact the Governor or the designated State agency for each affected State prior to initiating a study and enter into

such agreements as are necessary to carry out a coordinated planning effort.

Subpart C—National Objectives

§ 710.30 General.

(a) Two coequal national objectives provide the basis for formulation of plans for the conservation and use of water and related land resources. These objectives are protection and enhancement of national economic development (NED) and protection and enhancement of environmental quality (EQ).

(b) Water and related land resource plans are to be formulated to improve the quality of life through contributions to the NED and EQ objectives. Plans are to be formulated to alleviate problems and take advantage of opportunities that occur at the national, regional, State, and local levels in ways that contribute to the NED and EQ objectives.

§ 710.31 National economic development.

Contributions to national economic development are identified by increases in the value of the national output of goods and services.

§ 710.32 Environmental quality.

Contributions to environmental quality are identified by protection of or improvements in the quantity of natural and cultural resources as measured in common physical units or in the quality of these resources as measured in terms of specific EQ values.

Subpart D—Inventory

§ 710.40 Inventory.

An inventory is to be made to determine the quantity and characteristics of water and related land resources of the study area and to identify opportunities for further use or preservation of those resources. The inventory is to include data appropriate to the identified problems and opportunities and the potential for formulating and evaluating alternative plans. The inventory is to identify both present and projected future resource conditions without any of the alternative plans.

Subpart E—Alternative Plans

§ 710.50 General.

(a) This subpart applies to Level B and Level C studies.

(b) An alternative plan consists of structural and/or nonstructural measures, strategies, or programs formulated to alleviate specific problems or take advantage of specific opportunities associated with water and related land resources in the study area.

(c) A range of possible alternative plans implementable by various levels of government and by nongovernment interests is to be systematically formulated in terms of the contributions of each plan to the national economic development and environmental quality objectives. Each plan is to represent an alternative for reallocating or preserving water and related land resources to alleviate the identified problems or realize the opportunities.

(d) Alternative plans are not to be limited to those the Federal planning agency could implement directly under current authorities. Plans that may be implemented under the authorities of other Federal agencies, State and local entities, and nongovernment interests are also to be considered. Therefore, the cooperative role of local, State, regional, Federal organizations, and nongovernment interests in implementing alternatives will be stressed.

(e) Measures included in alternative plans are to be in compliance with existing statutes, administrative regulations, and established common law. However, the planning effort, including the further development of alternatives, may include an evaluation of the possibility and the effect of changing such statutes, regulations, or common law.

(f) Water conservation is to be fully integrated into plan formulation as a means of achieving NED and EQ objectives. Water conservation consists of actions that will—

(1) Reduce the demand for water;

(2) Improve efficiency in use and reduce losses and waste; and/or

(3) Improve land management practices to conserve water.

A clear contrast is drawn between the above conservation elements and storage facilities. A range of measures that can, over time, balance water demanded for various purposes with water availability is to be considered.

(g) Alternative plans are to include appropriate mitigation measures as determined by the responsible Federal planning agency. Mitigation measures are to be implemented concurrently with and in proportion to the installation of other plan measures. Fish and wildlife habitat mitigation measures are to be planned in coordination with Federal and State fish and wildlife agencies as required by the rules implementing the Fish and Wildlife Coordination Act of 1958 (16 U.S.C. 661–664).

§ 710.51 Required alternative plans.

Alternative plans are to include: a national economic development plan, an environmental quality plan, and a primarily nonstructural plan. These particular plans are required to ensure that consideration is given to the widest practical range of alternative plans. The concept of a practical alternative plan means that the NED or EQ plan may include elements which address the other objective.

(a) *National economic development plan.*—A plan that maximizes net contributions to the NED objective is to be included as one alternative. This plan is to be systematically formulated to alleviate the specific problems and take advantage of the specific opportunities that define the NED objective for the relevant planning area. If no such plan can be formulated, the no action alternative is the NED plan.

(b) *Environmental quality plan.*—A plan that maximizes net contributions to the EQ objective is to be included as one alternative. This plan is to be systematically formulated to alleviate the specific problems, take advantage of the specific opportunities, and preserve the specific attributes that define the EQ objective for the relevant planning area. If no such plan can be formulated, the no action alternative is the EQ plan.

(c) *Primarily nonstructural plan.*—(1)A "primarily nonstructural" plan is to be formulated and included as a candidate plan (See § 710.90) whenever structural project or program alternatives are considered.

(2) A primarily nonstructural plan is the plan that makes maximum feasible use of nonstructural measures to address water resource problems and opportunities. The determination of maximum feasible use will be based on the maximum use of nonstructural measures that contribute to the NED and the EQ objectives.

(3) Nonstructural measures are complete or partial alternatives to the traditional structural measures for addressing water resources problems and opportunities. The ideal nonstructural alternative is the least cost, implementable modification in public policy, management practice, regulatory policy, or pricing policy that would bring marginal benefits and marginal costs for each project output into equality. The NED and EQ objectives are to serve as the basis for the measurement of costs and benefits.

§ 710.52 Other alternative plans.

Other alternative plans that make varying contributions to the NED and EQ objectives and contributions to various mixes of these objectives should be formulated so as to adequately explore the range of alternative plans for addressing the NED and EQ objectives.

Subpart F—Accounts

§ 710.60 General.

(a) This subpart applies to Level B and Level C studies.

(b) Four accounts are to be used in organizing the information on effects of candidate plans (See § 710.90). These four accounts are: national economic development (NED), environmental quality (EQ), regional economic development (RED), and other social effects (OSE). These four accounts encompass all significant effects of a plan on the human environment as required by NEPA and on social well-being as required by Section 122 of the Flood Control Act of 1970 (Pub. L. 91–611, 84 Stat. 1823).

(c) Relationships between short-term use of the environment and long-term maintenance and enhancement of productivity, are to be identified in the appropriate account or accounts. Any irreversible or irretrievable commitments of resources are also to be identified in the appropriate account or accounts.

(d) Effects of an alternative plan in each account are the differences between the projected conditions "with the plan" and projected conditions "without the plan."

(e) Values in the NED account are to be expressed in monetary units. Values in the EQ account are to be expressed in appropriate quantitative units or qualitative terms. Values in the RED account are to be expressed in a combination of monetary and other quantitative units. Values in the OSE account are to be expressed in monetary units, other quantitative units, or qualitative terms.

(f) Monetary values in the accounts are measured in annual sums and converted to average annual equivalents by appropriate discounting techniques.

§ 710.61 National economic development account.

(a) Beneficial effects in the NED account are increases in the economic value of the national output of goods and services. These beneficial effects include: the value of goods and services from a plan; the value of output resulting from external economies caused by a plan; and the value associated with the use of otherwise unemployed or underemployed labor.

(b) Adverse effects in the NED account are the opportunity costs of resources used in the production of structural and nonstructural measures in a plan. In evaluating NED costs, resource use is broadly defined to include all aspects of the economic value of the resource. This requires consideration of the direct and indirect, private and public uses that producers and consumers are currently making of available resources or are expected to make of them in the future. For convenience of measurement and analysis, NED costs are to be classified as project outlays, associated costs, other direct costs, and external diseconomies.

§ 710.62 Environmental quality account.

(a) Beneficial effects in the EQ account are improvements in the quantity of natural and cultural resources or in the quality of these resources as measured by ecological, aesthetic, historic, educational/scientific, and pristine values. The evaluation of EQ benefits is based on a process that includes scoping, inventory, assessment, and appraisal.

(b) Adverse effects in the EQ account are unfavorable changes in the quantity of natural and cultural resources or in the quality of these resources as measured by ecological, aesthetic, historic, educational/scientific, and pristine values. The evaluation of adverse effects is based on the same process used for evaluating EQ benefits.

§ 710.63 Regional economic development account.

(a) The RED account registers changes in the distribution of regional economic activity as a result of each alternative plan. Two measures of the effects of the plan on regional economies are used in the account: regional income and regional employment.

(b) The regions used for RED analysis are those regions within which the plan will have particularly signficant income and employment effects. Effects of a plan not occurring in the significantly affected regions are to be placed in a "rest of nation" category.

(c) There are major difficulties in estimating some effects in the RED account. RED effects may be excluded if they cannot be estimated in a sound manner or will not have a material bearing on the decisionmaking process.

§ 710.64 Other social effects account.

(a) The OSE account registers plan effects from perspectives which are not reflected in the other three accounts. The categories of effects in the OSE account may be the following: urban and community impacts (Office of Management and Budget Circular A–116); life, health, and safety factors; energy requirements and conservation.

(b) Effects that cannot be satisfactorily quantified or described with available methods, data, and information or will not have a material bearing on the decisionmaking process may be excluded from the OSE account.

Subpart G—Displays

§ 710.70 General.

(a) This subpart applies to Level B and Level C studies.

(b) Displays are graphs, tables, and summary statements in a format which facilitates the analysis and comparison of alternative plans. Concise, understandable displays are needed during the planning process and to provide documentation in compliance with NEPA.

§ 710.71 Content and format.

(a) Displays are to report the present and projected future resource conditions without any of the alternative plans and described the problems and opportunities related to the planning setting.

(b) Displays regarding candidate plans (See § 710.90) are to include—

(1) Measures in each plan; and

(2) Effects in the NED, EQ, RED, and OSE accounts.

Subpart H—Cost Allocation

§ 710.80 Cost allocation.

(a) This subpart applies to Level B and Level C studies.

(b) Cost allocation is the process of apportioning financial costs among purposes served by a plan. The need for cost allocation among purposes stems from pricing and cost-sharing policies that vary among purposes. Cost allocation among purposes and the apportionment of cost shares to Federal and non-Federal public and private and private interests are steps in the preparation of RED and OSE accounts.

(c) Financial costs are to be allocated to those purposes served by a plan. All purposes are to be treated comparably.

Subpart I—Plan Selection

§ 710.90 General.

(a) This subpart applies to Level B and Level C studies.

(b) The planning process leads to identification of alternative plans that could be recommended or selected. These plans are referred to as candidate plans. It is from among these plans that a recommended plan is to be selected. The culmination of the planning process is the selection of the recommended plan to be implemented, or the decision to take no action. The selection is to be based upon a comparison of effects of alternative plans.

§ 710.91 Net benefits rule.

(a) A recommended plan (when considered individually on the basis of the with-plan versus without-plan comparison) must have combined beneficial NED and EQ effects that outweigh combined adverse NED and EQ effects. For example, a plan lacking net NED benefits may be recommended if net EQ benefits are sufficiently large, even though EQ benefits are not stated in monetary terms.

(b) The affected river basin commission, Secretary of a Department, or head of an independent agency may make an exception to the net benefits rule if circumstances warrant such exception. A decision to make an exception is to be documented and the reasons given.

Subpart J—Planning Process

§ 710.100 Level B and Level C studies.

(a) Level B and Level C water and related land resources planning consists of the following major steps:

(1) Specify the water and related land resources problems and opportunities (relevant to the planning setting) associated with the NED and EQ objectives;

(2) Inventory and analyze water and related land resource conditions within the planning area;

(3) Formulate alternative plans;

(4) Evaluate the effects of the alternative plans;

(5) Compare alternative plans; and

(6) Select a recommended plan based upon the comparison of alternative plans.

(b) Plan formulation is a dynamic process whose various steps should, at a minimum, be reiterated one or more times. This reiteration process, which may occur at any step, may sharpen the planning focus or changes its emphasis as new data are obtained or as the specification of problems or opportunities changes or becomes more clearly defined.

§ 710.101 Level A studies.

Any appropriate planning process may be chosen for Level A studies. Level A studies may involve only phases 1 and 2 of the process specified for Level B and Level C studies.

Subpart K—National Program for Federal and Federally Assisted Activities

§ 710.120 National programs.

The formulation of national programs requires that priorities be established among recommended plans for projects, States, regions, and river basins. Considerations such as budget resources, national environmental policy, and alternative public and private investments will provide the basis for formulating national programs.

2. By adding a new Part 711 to read as follows:

PART 711—PRINCIPLES AND STANDARDS FOR PLANNING WATER AND RELATED LAND RESOURCES—LEVEL C

Subpart A—Introduction

Sec.

711.1 Purpose.
711.2 Scope.
711.3 Authority.
711.4 Applicability.

Subpart B—General Planning Considerations

711.11 General setting—projections.
711.12 Scoping.
711.13 Public participation.
711.14 Period of analysis.
711.15 Risk and uncertainty—sensitivity analysis.
711.16 Discount rate.
711.17 Relative prices and general price levels.
711.18 Review and consultation.
711.19 Interdisciplinary planning.
711.20 Ground water.
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Subpart C—National Objective

711.30 General.
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711.82 Cost allocation procedures.
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Subpart I—Plan Selection

Sec.

711.92 Selection.
711.93 Net benefits rule.

Subpart J—Planning Process

711.100 Introduction.
711.101 Major steps.
711.102 Specification of the problems and opportunities associated with the NED and EQ objectives.
711.103 Inventory water and related land resource conditions within the planning area.
711.104 Formulation of alternative plans.
711.105 Evaluation of effects.
711.106 Comparison of alternative plans.
711.107 Plan selection.
711.108 Reiteration.

Authority: Sec. 103 and 402, Pub. L. 89–80, 79 Stat. 245 (42 U.S.C. 1962a–2 and d–1).

Subpart A—Introduction

§ 711.1 Purpose.

These Principles and Standards establish rules to be followed by the Water Resources Council (WRC) and WRC-designated agencies in planning Federal and Federally-assisted water and related land resource programs and projects. Their purpose is to establish uniformity in water and related land resources planning. These Principles and Standards include the Principles required for Level C studies established as Part 710 of this chapter. They provide the basic policy for the Procedures (Level C).

§ 711.2 Scope.

(a) These Principles and Standards cover water and related land resources planning. They establish the basic process to be followed by the Federal agencies and specify how each phase of the process is to be performed.

(b) The national objectives and accounts covered by these Principles and Standards incorporate and are consistent with the concept of human environment as used in the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321–4361) and the appropriate portions of the NEPA process regulations established by the Council on Environmental Quality (CEQ) in 40 CFR Parts 1500–1508.

§ 711.3 Authority.

These Principles and Standards are established as rules pursuant to the Water Resources Planning Act of 1965 (Pub. L. 89–80), as amended (42 U.S.C. 1962a–2 and d–1). These Principles and Standards supersede the *Principles and Standards for Planning Water and Related Land Resources*, 38 FR 24781–24862, September 10, 1973, revisions in 44 FR 72978–72990, December 14, 1979, and revisions in 39 FR 29242, August 14, 1974.

§ 711.4 Applicability.

(a) These Principles and Standards apply to the planning of Level C Implementation Studies which are defined as program or project feasibility studies generally undertaken by a single Federal agency and which are expected to result in project authorization, funding, and implementation. These studies are conducted in response to findings and conclusions identified in assessments and regional and river basin studies, or in direct response to national, regional, State or local problems and opportunities. The following agency activities are explicitly covered:

(1) Corps of Engineers water resources projects.

(2) Water and Power Resources Service water resources projects.

(3) Tennessee Valley Authority water projects.

(4) Soil Conservation Service water and related land resources projects.

(5) National Park Service, Heritage Conservation and Recreation Service, and Forest Service national recreation area projects.

(6) Forest Service and National Park Service wild, scenic, and recreational river studies.

(7) Fish and Wildlife Service Federal waterfowl refuge projects.

(b) These Principles and Standards are applicable to—

(1) Projects that may be approved by agency administrators;

(2) Projects requiring Congressional authorization; and

(3) Authorized projects not yet under construction for which agencies currently prepare postauthorization planning documents.

(c) The Secretary of a department and head of an independent agency shall retain the discretion to exempt projects not yet authorized for which preauthorization planning is now complete or will be complete by the end of fiscal year 1981 and those authorized projects requiring post-authorization planning if such planning is now complete or will be complete by the end of fiscal year 1981.

(d) Authorized projects exempted from complying with the Principles and Standards of September 10, 1973 are exempt from complying with these Principles and Standards.

(e) These Principles and Standards shall take effect 30 days from the date of their publication in the **Federal Register.**

Subpart B—General Planning Considerations

§ 711.11 General setting—projections.

(a) Formulation and evaluation of alternative plans are to be based on the most likely conditions expected to exist in the future with and without the plan. The projection of with- and without-plan conditions is to be based on national and regional projections of income, employment, output, population, and land use trends, the amounts of goods and services likely to be demanded, and expected environmental conditions. The without-plan condition is the condition expected to prevail in the absence of any alternative plan in the study and is the same as the alterntive of taking no action.

(b) National projections used in planning are to be based on a reasonably full employment economy. This does not preclude consideration of special analyses of regions with high rates of unemployment and underemployment in calculating benefits from using unemployed and underemployed labor resources.

(c) National and State environmental and social standards and thresholds relating to such categories as water quality, air quality, or minimum health are to be considered.

(d) Other approved plans that have been adopted for the planning area and other current planning efforts are to be considered.

(e) Projections are to be made for selected years over the period of analysis to indicate how changes in economic conditions and environmental resources are likely to have an impact on problems and opportunities.

(f) Environmental projections are to be identified in terms of specific indicators of the quantity and quality of natural and cultural resources.

§ 711.12 Scoping.

(a) Planning is to include an early and open process termed "scoping" to identify both the likely significant issues and the range of issues to be addressed. As soon as practicable after a decision to begin planning, the agency is to undertake scoping. This effort should include affected Federal, State and local agencies and other interested groups or persons. Scoping is to be used as appropriate throughout planning to ensure that all significant decisionmaking factors are addressed.

(b) As part of the scoping process the agency should:

(1) Determine the extent to which the likely significant issues are to be analyzed.

(2) Identify and eliminate from detailed study any issues that are not significant or that have been adequately covered by prior study.

(3) Identify any current or future planning that is related to but not part of the study under consideration.

(4) Identify other review and consultation requirements so that cooperating agencies, if any, may prepare other required analyses and studies concurrently and integrated with the study under consideration.

(5) Indicate the tentative planning and decisionmaking schedule.

(6) Hold an early scoping meeting or meetings. The scoping meetings may be integrated with other early planning meetings if the impacts of a particular action are confined to specific sites.

(7) Repeat the above steps if there is a substantial change in the planning emphasis or if new circumstances or information make it necessary.

(c) Scoping may be used to combine or narrow the number of problems, opportunities, measures, plans, effects, etc., so that meaningful and efficient analysis and choice among alternative plans can occur.

§ 711.13 Public participation.

(a) Interested and affected agencies, groups, and individuals are to be provided opportunities to participate throughout the planning process. The responsible Federal planning agency is to contact: other Federal agencies; the governors or State agencies responsible for water planning; appropriate regional, State, and local agencies; national, regional, and local groups; and individuals to solicit their participation. A joint public participation program should be established with willing agencies and groups.

(b) Public participation may be accomplished by—

(1) Soliciting public opinion early in the planning process;

(2) Encouraging periodic oral expressions of public views and recording and considering them;

(3) Holding public meetings early in the planning process to advise the public of the nature and scope of the study, to open lines of communication, to listen to the needs and views of the public, and to identify interested individuals and agencies;

(4) Holding additional public meetings as appropriate throughout the planning process; and

(5) Making pertinent plans, reports, data analyses, interpretations, and other information available for public inspection.

(c) Efforts to secure public participation should be pursued through public hearings, public meetings, workshops, information programs, citizen committees, and other appropriate means.

§ 711.14 Period of analysis.

The period of analysis is to be the same for all effects being evaluated. The period of analysis is to be the lesser of—

(a) The period of time over which the plan would serve a useful purpose; or

(b) A period not to exceed 100 years.

§ 711.15 Risk and uncertainty—sensitivity analysis.

(a) Situations of risk are defined as those in which the potential outcomes can be described in reasonably well known probability distributions. Some types of risks, such as the probability of particular flood damages, are to be incorporated in the planning and evaluation procedures. In situations of uncertainty, potential outcomes cannot be described in objectively known probability distributions.

(b) Risk and uncertainty arise from measurement errors and from the underlying variability of complex natural, social, and economic situations. Methods of dealing with risk and uncertainty include:

(1) Collection of more detailed data to reduce measurement error.

(2) Use of more refined analytic techniques.

(3) Increasing safety factors in design.

(4) Selection of measures with better known performance characteristics.

(5) Reducing the irreversible or irretrievable commitments of resources.

Reducing risk and uncertainty may involve increased costs or loss of benefits. The advantages and costs of reducing risk and uncertainty are to be considered in the planning process.

(c) Plans should be examined to determine the uncertainty inherent in the data or various assumptions of future economic, demographic, environmental, and technological trends. Reasonably probably projections that would, if realized, appreciably affect plan design should be analyzed.

(d) The planner's primary role in dealing with risk and uncertainty is to identify the areas of sensitivity and describe them clearly so that decisions can be based on the best available information.

§ 711.16 Discount rate.

The discount rate to be used for the formulation and economic evaluation of plans for water and related land resources will be published by the Water Resources Council at the beginning of each fiscal year. The rate will be determined in accordance with § 704.39 of this chapter.

§ 711.17 Relative prices and general price levels.

(a) Relative price relationships for outputs and inputs prevailing during or immediately preceding the period of planning are generally to be used to represent the price relationships expected over the period of analysis, unless specific considerations indicate that other assumptions should be made. Exceptions to the general rule will occur if real exchange values are expected to change over the period of analysis.

(b) The general level of prices for outputs and inputs prevailing during or immediately preceding the period of planning are to be used to represent the prices expected over the period of analysis, except to the extent that the real value of specific outputs or inputs is expected to change.

(c) It is recognized that the relationships between monetized and non-monetized values may change over the period of analysis. Any assumption of change is to be documented.

§ 711.18 Review and consultation.

Review and consultation with interested and affected agencies, groups, and individuals are required in the planning process. Reviews are to be consistent with the requirements of the NEPA process (40 CFR Parts 1500–1508). The NEPA process and the planning process described in these Principles and Standards are complementary.

§ 711.19 Interdisciplinary planning.

Planning is to use an interdisciplinary approach that will ensure the integrated use of the natural and social sciences and the environmental design arts. The disciplines of the planners are to be appropriate to the scope and issues identified in the scoping process (See § 711.13).

§ 711.20 Ground water.

(a) Planning studies are to give appropriate consideration to any ground water problems in the study area and the effects of the alternative plans on ground water resources.

(b) Within the framework of the planning process, the responsible planning agency is to determine—

(1) Whether any ground water problems exist in the study area under present or projected conditions;

(2) Whether and to what extent the alternative plans will cause or contribute to ground water problems; and

(3) What actions would avoid or minimize ground water problems.

Such considerations are to be in accordance with NED and EQ objectives, and the effects of alternative plans on ground water are to be recorded in the appropriate account (See Subpart F).

§ 711.21 Instream flow.

Within the scope of the planning process, the responsible planning agency is to determine and consider instream flow needs relevant to the planning setting. Effects of modifying instream flow are to be recorded in the appropriate accounts.

§ 711.22 Documentation.

Planning studies are to be documented in a clear, concise manner such that an independent reviewer can fully and clearly understand the basic decisions that were made and the reasons for them.

§ 711.23 Federal-State relationship in planning.

The responsible Federal planning agency is to contact the Governor or the designated State agency for each affected State prior to initiating a study and enter into such agreements as are necessary to carry out a coordinated planning effort.

Subpart C—National Objectives

§ 711.30 General.

(a) Two coequal national objectives provide the basis for formulation of plans for the conservation and use of water and related land resources. These objectives are protection and enhancement of national economic development (NED) and protection and enhancement of environmental quality (EQ).

(b) Water and related land resource plans are to be formulated to improve the quality of life through contributions to the NED and EQ objectives. Plans are to be formulated to alleviate problems and take advantage of opportunities that occur at the national, regional, State, and local levels in ways that contribute to the NED and EQ objectives.

§ 711.31 National economic development.

(a) Contributions to national economic development are identified by increases in the value of the National output of goods and services.

(b) The NED objective for the relevant planning setting is stated in terms of the public's expressed desired to alleviate problems and realize opportunities related to the output of goods and services or to increased economic efficiency.

(c) Each statement of problems or opportunities is to be expressed in terms of a desired output. The statement should identify the problem or opportunity and indicate the desired output. Example statements are:

(1) Reduce flood losses in the Red River floodplain to increase agricultural production;

(2) Increase the agricultural output of the irrigated sector of Tolland County; and

(3) Improve the quality of the recreational experience at Lake Zoar.

§ 711.32 Environmental quality.

(a) Contributions to environmental quality are identified by protection of or improvements in the quantity of natural and cultural resources as measured in common physical units or in the quality of these resources as measured in terms of specific EQ values. The values are:

(1) The ecological value of natural resources that support or provide the food, water, cover, reproduction, space, and other life requirements of plant and animal populations and communities.

(2) The aesthetic value of views, sounds, scents, and other perceptual stimuli of natural and cultural resources that provide diverse and pleasant surroundings.

(3) The historic value of natural resources and cultural places, objects, and lore that have played a special role in influencing the course of human activity or that have religious or cultural significance to a group.

(4) The educational and scientific value of natural and cultural resources that convey an understanding of how and why things occur or have occurred in the past. or that have potential for future educational or scientific use.

(5) The pristine value of natural resources that provide the opportunity to experience or contemplate conditions essentially unaltered by man or substantially recovered from prior human influence.

(b) Desirable levels of ecological, aesthetic, historic, educational/scientific, and pristine values are based on institutional recognition (laws); on judgments by scientific and technical experts; and on the expressed concerns of the public.

(c) The EQ objective for the relevant planning setting is stated in terms of the public's expressed desire to alleviate problems, preserve options, and realize opportunities related to the quantity or quality of natural and cultural resources. Each statement is to be expressed in terms of a desired output.

(1) EQ problems exist when—

(i) The present EQ resource value in a study area is below the desired level and will remain static or continue to decline under current trends; or

(ii) The present EQ resource value is expected to decline in the absence of protective action.

(Example statement: Modify streamflows in the Rocky River to stem the decline in steelhead populations.)

(2) EQ opportunities exist whenever an action might be taken to enhance a condition that may or may not be considered a problem.

(Example statement: Improve the 18,000-acre wetland in Beautiful Valley to provide additional food and cover for waterfowl use.)

Subpart D—Inventory

§ 711.40 Resource conditions.

(a) An inventory is to be made to determine the quantity and characteristics of water and related land resources of the study area and to identify opportunities for further use or preservation of those resources. The inventory is to include data appropriate to the identified problems and opportunities and the potential for formulating and evaluating alternative plans. The inventory does not necessarily include an exhaustive listing of resources of the area.

(b) The inventory is to identify both present and projected future resource conditions without any of the alternative plans. This without-plans condition serves as the base for evaluating the effects of each of the alternative plans.

§ 711.41 Problems and opportunities.

(a) The inventory phase should also include an analysis of the identified problems and opportunities and their implications on the planning setting. This analysis should be used to redefine the specific problems and opportunities associated with the NED and EQ objectives.

(b) Based on this analysis, an appraisal is to be made of the potential for alleviating the problems and realizing the opportunities. This provides guidance as to the possible scope and magnitude of actions to meet the demands for each problem or opportunity. This appraisal should identify possibilities for management, development, preservation, and other opportunities for action. Resource inventories may suggest additional problems or opportunities. These possibilities will indicate the resource capabilities relative to specific commodities, services, or environmental amenities desired by the public. By proper selection of these development or management possibilities, alternatives may be formulated for each problem or opportunity associated with NED and EQ objectives.

§ 711.42 Constraints.

Constraints to the attainment of the desired levels of national output of goods and services or environmental amenities for the planned period are to be identified. Constraints may include resource limitations, competitive use of the resources, legislation that prohibits desired use or development, or other limitations.

Subpart E—Alternative Plans

§ 711.50 General.

(a) This subpart defines the alternative plans to be formulated in the planning process.

(b) An alternative plan consists of structural and/or nonstructural measures, strategies, or programs formulated to alleviate specific problems or take advantage of specific opportunities associated with water and related land resources in the study area.

(c) A range of possible alternative plans implementable by various levels of government and by nongovernment interests is to be systematically formulated in terms of the contributions of each plan to the national economic development and environmental quality objectives. Each plan is to represent an alternative for reallocating or preserving water and related land resources to alleviate the identified problems or realize the opportunities.

(d) Alternative plans are not to be limited to those the Federal planning agency could implement directly under current authorities. Plans that may be implemented under the authorities of other Federal agencies, State and local entities, and nongovernment interests are also to be considered. Therefore, the cooperative role of local, State, regional, Federal organizations, and nongovernment interests in implementing alternatives will be stressed.

(e) Measures included in alternative plans are to be in compliance with existing statutes, administrative regulations, and established common law. However, the planning effort, including the further development of alternatives, may include an evaluation of the possibility and the effect of changing such statutes, regulations, or common law.

(f) Water conservation is to be fully integrated into plan formulation as a means of achieving NED and EQ objectives. Water conservation consists of actions that will—

(1) Reduce the demand for water;

(2) Improve efficiency in use and reduce losses and waste; and/or

(3) Improve land management practices to conserve water.

A clear contrast is drawn between the above conservation elements and storage facilities. A range of measures that can, over time, balance water demanded for various purposes with water availability is to be considered.

(g) Alternative plans are to include appropriate mitigation measures as determined by the responsible Federal planning agency. Mitigation measures are to be implemented concurrently with and in proportion to the installation of other plan measures. Fish and wildlife habitat mitigation measures are to be planned in coordination with Federal and State fish and wildlife agencies as required by the rules implementing the Fish and Wildlife Coordination Act of 1958 (16 U.-S.C. 661–664).

(h) Plans, or increments thereto, are not to be recommended for Federal development that would physically or economically preclude non-Federal plans which would likely be undertaken in the absence of the Federal plan and which would more effectively contribute to the NED and EQ objectives when comparably evaluated according to these Principles and Standards. Taxes foregone on the proposed Federal Plan and taxes paid on the non-Federal alternative are to be excluded in such comparisons.

711.51 Required alternative plans.

Alternative plans are to include: a national economic development plan, an environmental quality plan, and a primarily nonstructural plan. These particular plans are required to ensure that consideration is given to the widest practical range of alternative plans. The concept of a practical alternative plan means that the NED or EQ plan may include elements which address the other objective.

(a) *National economic development plan.* A plan that maximizes net contributions to the NED objective is to be included as one alternative. This plan is to be systematically formulated to alleviate the specific problems and take advantage of the specific opportunities that define the NED objective for the relevant planning area. If no such plan can be formulated, the no action alternative is the NED plan.

(b) *Environmental quality plan.* (1) A plan that maximizes net contributions to the EQ objective is to be included as one alternative. This plan is to be systematically formulated to alleviate the specific problems, take advantage of the specific opportunities, and preserve the specific attributes that define the EQ objective for the relevant planning area. If no such plan can be formulated, the no action alternative is the EQ plan.

(2) In formulating alternatives to maximize net contributions to the EQ objective, consideration is to be given to measures that explicitly preclude any significant forms of physical construction or development. Positive actions, such as zoning changes or public land acquisition, may be necessary to assure realization of the "no development" concepts.

(c) *Primarily nonstructural plan.* (1) A "primarily nonstructural" plan is to be formulated and included as a candidate plan (see § 711.90) whenever structural project or program alternatives are considered.

(2) A primarily nonstructural plan is the plan that makes maximum feasible use of nonstructural measures to address water resources problems and opportunities. The determination of maximum feasible use will be based on the maximum use of nonstructural measures that contribute to the NED and EQ objectives.

(3) Nonstructural measures are complete or partial alternatives to the traditional structural measures for addressing water resources problems and opportunities. The ideal nonstructural alternative is the least cost, implementable modification in public policy, management practice, regulatory policy, or pricing policy that would bring marginal benefits and marginal costs for each project output into equality. The NED and EQ objectives are to serve as the basis for the measurement of costs and benefits.

(4) A nonstructural measure or measures may in some cases offer a complete alternative to a traditional structural measure or measures. In other cases, nonstructural measures may be combined with fewer or smaller traditional structural measures to produce a complete alternative. It may at times be necessary to combine structural and nonstructural measures to formulate alternative plans for attainment of the planning objectives.

(5) The assessment of nonstructural measures should be considered for all water resources planning purposes, including water supply, flood control, power, transportation, recreation, fish and wildlife, and other purposes.

§ 711.52 Other alternative plans.

Other alternative plans that make varying contributions to the NED and EQ objective and contributions to various mixes of these objectives should be formulated so as to adequately explore the range of alternative plans for addressing the NED and EQ objectives. The number and variety of alternative plans will be governed by—

(a) The problems and opportunities associated with the water and related land resources in the study area;

(b) The overall resource capabilities of the study area;

(c) The available alternative measures; and

(d) Preferences and conflicts among different segments of the public regarding the trade-off between NED and EQ objectives.

Subpart F—Accounts

§ 711.60 General.

(a) This subpart defines the accounts to be used in organizing information on the effects of alternative plans.

(b) Four accounts are to be used in organizing the information on effects of candidate plans (see § 711.90). these four accounts are: national economic development (NED), environmental quality (EQ), regional economic development (RED), and other social effects (OSE). These four accounts encompass all significant effects of a plan on the human environment as required by NEPA and on social well-being as required by Section 122 of the Flood Control Act of 1970 (Pub. L. 91–611, 84 Stat. 1823).

(c) Relationships between short-term use of the environment and long-term maintenance and enhancement of productivity are to be identified in the appropriate account or accounts. Any irreversible or irretrievable commitments of resources are also to be identified in the appropriate account or accounts.

(d) Effects of an alternative plan in each account are the differences between the projected conditions "with the plan" and projected conditions "without the plan."

(e) Values in the NED account are to be expressed in monetary units. Values in the EQ account are to be expressed in appropriate quantitative units or qualitative terms. Values in the RED account are to be expressed in a combination of monetary and other quantitative units. Values in the OSE account are to be expressed in monetary units, other quantitative units, or qualitative terms.

(f) Monetary values in the accounts are measured in annual sums and converted to average annual equivalents by appropriate discounting techniques.

(g) Each account is to provide a statement of the effects of a plan from a particular point of view. Accounts are to be viewed independently, and are not to be aggregated. A plan may produce monetary benefits in the NED account, the same or greater monetary benefits in the RED account, net increases in several resource values in the EQ account, and several effects in the OSE account. However, within a given account, a monetary benefit or cost, change in resource value, or effect can be claimed only once. Claiming the same benefit, cost, change in resource

value, or effect more than once in a given account would constitute double counting, which is not permitted.

§ 711.61 National economic development account.

(a) *General.* (1) Beneficial effects in the NED account are increases in the economic value of the national output of goods and services. These beneficial effects include: the value of goods and services from a plan; the value of output resulting from external economies caused by a plan; and the value associated with the use of otherwise unemployed or underemployed labor.

(2) Adverse effects in the NED account are the opportunity costs of resources used in the production of structural and nonstructural measures in a plan.

(3) The procedures for evaluating NED effects are found in Part 713 of this chapter.

(b) *Goods and services.* (1) *General measurement standard.* The general measurement standard for the value of goods and services is defined as the willingness of users to pay for each increment of output from a plan. Such a value would be obtained if the "seller" of the output were able to apply a variable unit price and charge each user an individual price to capture the full value of the output to the user. Since, in most instances, it is not possible for the planner to measure the actual demand situation, four alternative techniques can be used to obtain an estimate of the total value of the output of the plan: willingness to pay based upon market price or simulated market price; change in net income; cost of the most likely alternative; and administratively established values.

(i) *Market price or simulated market price.* If the additional output from a plan is too small to have a significant effect on price, actual or simulated market prices will closely approximate the total value of the output and may be used to estimate willingness to pay. If the additional output is expected to have a significant influence on market price, and if the effects cannot be estimated more precisely, a price midway between the price expected with and without the plan may be used to estimate the total value.

(ii) *Change in net income.* The value of increased output of intermediate goods and services is measured by their total value as inputs to producers of final consumer products. The total value of intermediate goods or services to producers is properly measured as the increase in net income received by producers with a plan compared to net income received without a plan. Net income is defined as the market value of producers' outputs less the market value of producers' inputs exclusive of the cost of the intermediate goods or services resulting from a plan.

(iii) *Cost of the most likely alternative.* The cost of the most likely non-Federal alternative may be used to estimate NED benefits for a particular output if non-Federal interests are likely to provide a similar output in the absence of any of the alternative plans under consideration and if NED benefits cannot be estimated from market price or change in net income. This assumes, of course, that society would in fact undertake the alternative means. Because the planner may not be able to determine whether alternative means would be undertaken in the absence of the project, this procedure for benefit estimation is to be used cautiously in determining the most likely alternative, the planner is to give adequate consideration to nonstructural and conservation measures as well as structural measures.

(iv) *Administratively established values.* Administratively established values are values for specific goods and services explicitly set and published by WRC. An example of administratively established values is the range of unit day values for recreation. A value within this range of set values, in certain situations, may be selected in the absence of a specific estimate of willingness to pay.

(2) *Categories.* Goods and services in the NED account are limited to the following categories:

(i) Municipal and industrial (M & I) water supply.

(ii) Agricultural floodwater, erosion, and sedimentation.

(iii) Agricultural drainage.

(iv) Agricultural irrigation.

(v) Urban flood damage.

(vi) Power (hydropower).

(vii) Transportation (inland navigation).

(viii) Transportation (deep draft navigation).

(ix) Recreation.

(x) Commercial fishing.

(xi) Categories of benefits based on procedures approved by the Water Resources Council.

(xii) Other categories of benefits for which procedures are documented in the planning report and which are in accordance with the general measurement standards in paragraph (b)(1) of this section.

(3) *Specific measurement standards.* (i) *Municipal and industrial water supply.* Where water is priced at its marginal cost, that price is to be used to calculate willingness to pay for additional water supply. In the absence of such direct measures of willingness to pay, the benefits from a water supply plan are to be measured instead by the resource cost of the alternative most likely to be implemented in the absence of that plan. For smaller communities (population of 10,000 or less) that are not able to afford an alternative water supply comparable to the Federal water supply plan, the benefit is to be equal to the cost of the separable M&I facilities plus an appropriate share of the remaining joint cost of the project.

(ii) *Agricultural floodwater, erosion, and sedimentation.* Willingness of the users to pay is the basis for approximating the value of output from these activities, whether it be in the form of increased production of intermediate or final goods or release of resources. Productivity increases are determined by measuring the difference in net income accruing to the enterprise on the specified land resource without the plan compared with what that enterprise would receive as net income with the plan on the same land resource. Changes in land use benefits are determined by measuring the difference in net income from the enterprise at an alternative location that would be utilized without the plan compared with the net income from the enterprise at a new location which is improved or enhanced as a result of the plan or by measuring the net income change for the enterprise precluded from using the given land resources with the plan as compared with the without plan situation, plus the net income change for the enterprise that would be allowed to use the given land resource with the plan as compared to the without plan situation. Where it is not possible to directly employ net income changes to derive benefits, the estimate of actual or prospective damages to the physical properties of the enterprises involved can be employed as an approximation of net income change.

(iii) *Agricultural drainage.* The benefit is measured as the increased value of agricultural output to the nation or the reduced cost of maintaining a given level of output. See Section 711.61(b) (3) (ii).

(iv) *Agricultural irrigation.* The benefits are computed as the increased net income that would result from reduced production cost, or intensification benefits through production of current crops and increased acreages of rice, cotton, pasture, corn, oats, soybeans, wheat, milo, barley, or hay. The intensification benefits are computed as the difference in net income with compared to without

the plan. Increased acreages of other crops are evaluated as the efficiency gained in the project area as compared to typical lands in the WRC assessment subarea (ASA).

(v) *Urban flood damage.* Benefits accrue primarily through the reduction in actual or potential damages associated with land use. If floodplain use is the same with and without the plan, the benefit (inundation reduction benefit) is the increased net income generated by that use. If an activity is removed from the floodplain, this benefit is realized only to the extent that removal of the activity increased the net income of other activities in the economy. If the type of floodplain use is unchanged but the method of operation is modified because of the plan, the benefit (intensification benefit) is the increased net income generated by the floodplain activity. If an activity is added to the floodplain because of a plan, the benefit (location benefit) is the difference between aggregate net incomes (including economic rent) in the economically affected area with and without the plan.

(vi) *Power (hydropower).* Where energy from electric power plants is priced at its marginal cost, this price is to be used to calculate willingness to pay. In the absence of such direct measures of marginal willingness to pay, the benefit from energy produced by hydroelectric powerplants will be measured instead by the resource cost of the most likely alternative to be implemented in the absence of the hydroelectric powerplant.

(vii) *Transportation (inland navigation).* The basic enconomic benefit of a navigation plan is the reduction in the value of resources required to transport commodities. Navigation benefits can be categorized as cost reduction benefits (same origin-destination; same mode), shift of mode benefits (same origin-destination; different mode), shift of origin-destination benefits, and new movement benefits. A cost reduction benefit is the reduction in economic cost of using the waterway. A shift of mode benefit is the savings in resources from not having to use a more costly mode. A shift or origin benefit is the difference in total costs of getting the commodity to its place of use with and without the plan. A shift of destination benefit is the difference in net revenue to the producer with and without the plan. A new movement benefit is the value of the delivered commodity less the transportation and production costs with the plan.

(viii) *Transportation (deep draft navigation).* The economic benefits for deep draft navigation are the gains in national economic efficiency and the increase in the value of output of goods and services. The benefit categories are cost reduction benefits; same commodity, origin-designation, harbor; same commodity, origin-designation, different harbor; shift in commodity, origin-designation; induced commodity; prevention and reduction of damage; advance replacement and operation and maintenance savings; and dredged material utilization. Benefits accrue from reductions in economic costs, savings in resources, increased outputs and land enhancement.

(ix) *Recreation.* For the most part, water oriented recreation is produced publicly and distributed in the absence of a viable market mechanism. For this reason, the increase in recreation provided by a plan may be measured on the basis of simulated willingness to pay. The methods which may be used to approximate demand and what people are willing to pay are the travel cost method, the contingent valuation method, and the unit day value method.

(A) With the travel cost method using marginal travel costs as a measure of what people are willing to pay for water oriented recreation and how price affects use, the relationship between price and per capita attendance can be established for recreation sites and market areas. This relationship, the conventional demand curve having a negative slope, sums up the response of user's demand to alternative prices of the recreational product (or experience). The area under this demand curve to the left of the capacity constraint plus any user fees measures total willingness to pay for recreational opportunities at the site.

(B) With the contingent valuation method, annual willingness to pay can be obtained directly from potential visitors by a survey which establishes a simulated market. Users are allowed to bid on the annual use of the site until the maximum willingness to pay is established. This method may be applied where lack of data, insufficient variability in travel costs, or unique characteristics of the site make use of the travel cost method inappropriate.

(C) Where use of demand estimating techniques such as travel cost or contingent valuation methods is not cost effective because of the small size of the project, a single value (unit day value method) per recreation day may be chosen from a range of values. These ranges will reflect availability of general or specialized recreation opportunities, location of the site relative to alternative opportunities, and characteristics of the user population.

(x) *Commerical fishing.* The benefits, which include consumer surplus to commercial fishing, can be measured as the resulting change in the value of output minus those costs related to their production. When a plan affects the market supply of fish such that the change in output is small relative to current output and therefore will not affect market price, the value of extra output can be measured by the change in revenue less associated cost of harvesters. If the additional output generated by the change in supply is expected to affect output prices, the gross value of extra output can be estimated using a price midway between that expected with and without the plan. This gross value measure minus the increase in costs to primary harvesters provides an estimate of the value of the increase in production including consumer surplus.

(c) *External economies.* (1) The external economies to be included in the NED benefit evaluation are the uncompensated, incidental, and unintended effects of a project that increase economic efficiency by increasing the output of intermediate or final consumer goods over and above the direct outputs accounted for in the plan or project. In this sense, the pertinent external economies are "external" to the plan or project. Pertinent external economies involve a technical or physical relationship. For example, a project planned only for flood control and hydropower purposes might reduce downstream water treatment cost; this reduction in costs would be shown as an external economy in the NED account.

(2) The external economies to be included in the NED account do not include decreases in the price of products or services resulting from the plan or changes in the prices of related goods and services.

(d) *Use of otherwise unemployed or underemployed labor resources.* (1) If otherwise unemployed or underemployed labor resources are used in implementing a plan the social cost of implementation is less than the financial cost. The opportunity cost of employing otherwise unemployed workers is conceptually equal to the value of leisure time foregone by such workers but may be assigned a zero value since there is no generally accepted procedure for measuring the value of leisure time. The opportunity cost of employing otherwise underemployed workers is equal to earnings under without plan conditions.

(2) Conceptually, the effects of the use of unemployed or underemployed labor resources should be treated as an

adjustment to the adverse effects of a plan on national economic development. Since this approach leads to difficulties in cost allocation and cost sharing calculations, the effects from the use of such resources are to be treated as an addition to the benefits resulting from a plan.

(3) Beneficial effects from the use of unemployed or underemployed labor resources are limited to labor employed onsite in the construction or installation of a plan. This limitation reflects identification and measurement problems and the general requirement that national projections are to be based on a reasonably full employment economy.

(4) WRC is to develop a list of planning regions with substantial and persistent unemployment based on criteria approved by WRC. The list will be updated periodically and distributed to planning agencies.

(5) Where the planning region has been designated as having substantial and persistent unemployment and it can be shown that these labor resources will in fact be employed or more effectively employed compared to the without-plan condition in construction or installation of the plan, the net additional payments to the unemployed or underemployed labor resources are defined as a benefit.

(e) *Adverse effects—NED.* (1) *Measurement standards.* (i) In evaluating NED costs, resource use is broadly defined to include all aspects of the economic value of the resource. This requires consideration of the direct and indirect, private and public uses that producers and consumers are currently making of available resources or are expected to make of them in the future.

(ii) If market prices reflect the full economic value of a resource to society, they are to be used to determine NED costs. If market prices do not reflect these values, it is intended that associated costs, other direct costs, and external diseconomies will account for the additional values.

(iii) NED costs should be adjusted by an allowance for the salvage value of land, equipment, and facilities that would have value for nonproject uses at the end of the period of analysis.

(2) *Cost categories.* For convenience of measurement and analysis, NED cost are to be classified as project outlays, associated costs, other direct costs, and external diseconomies.

(i) *Project outlays.* The NED costs of project outlays include the costs incurred by the responsible Federal entity and by other Federal or non-Federal entities to construct a project in accordance with sound engineering and environmental principles and to place it in operation. These costs include postauthorization costs for investigation, survey, planning, and design; construction costs; construction contingency costs; administrative services costs; mitigation costs; relocation cost (excluding transfer payments); historical and archaeological salvage cost, land, water, and mineral rights costs; and operation, maintenance and replacement costs.

(ii) *Associated costs.* These are the cost of measures needed over and above project measures to achieve the benefits claimed during the period of analysis. For example, associated costs would include the cost of irrigation water supply laterals and on-farm irrigation systems.

(iii) *Other direct costs.* These are the costs of resources directly required for a project or plan, but for which no financial outlays are made. For example, other direct costs would include displaced public recreational use at a project site.

(iv) *External diseconomies.* These costs are uncompensated, offsite NED losses caused by the installation, operation, maintenance, or replacement of project or plan measures. Examples of external diseconomies include increased downstream flood damages caused by channel modifications, dikes, or the drainage of wetlands, and increased water supply treatment costs caused by irrigation return flows.

§ 711.62 Environmental quality account.

(a) *General.* (1) For convenience of measurement and analysis, beneficial and adverse effects in the EQ account are classified according to the resources affected.

(2) The procedures for evaluating EQ effects are in Part 714 of this chapter.

(b) *Beneficial effects—EQ.* Beneficial effects in the EQ account are improvements in the quantity of natural and cultural resources or in the quality of these resources as measured by ecological, aesthetic, historic, educational/scientific, and pristine values. These values are described in § 711.32. The evaluation of EQ benefits is based on a process that includes scoping, inventory, assessment, and appraisal.

(1) Scoping is performed to limit and define the geographic area, the EQ resources and values, and the time period to be used in the evaluation.

(2) Inventorying is performed to collect and develop data, within the limits defined in scoping, for use in assessing the effects. Inventorying includes forecasting the without-plan and with-plan resource conditions.

(3) Assessment is performed to identify and, where possible, measure the effects of alternative plans on EQ resources. For a given resource the difference between the without-plan condition and the with-plan condition is the effect of the plan on that resource.

(4) Appraisal is performed to evaluate the desirability of effects on EQ resources. Appraisal is based on institutional recognition, public concern, and technical and scientific judgment.

(c) *Adverse effects—EQ.* Adverse effects in the EQ account are unfavorable changes in the quantity of natural and cultural resources or in the quality of these resources as measured by ecological, aesthetic, historic, educational/scientific, and pristine values. These values are described in § 711.32. The evaluation of adverse effects is based on the same process used for evaluating EQ benefits. This process is given in paragraph (b) of this section.

(d) *Net effect on environmental quality.* The net effect on environmental quality is based on an appraisal of the EQ beneficial and adverse effects. This appraisal is to be conducted on each alternative plan to determine if it has net benefits, net adverse effects, or no net EQ effect. This determination is to be made by the appropriate agency decisionmaker on the basis of the summary appraisal of effects. Institutional recognition, public concern, and technical and scientific judgment factors are to be explicitly included in the determination of the net EQ effect. The basis for the determination is to be clearly documented.

§ 711.63 Regional economic development account.

(a) *General.* (1) The RED account registers changes in the distribution of regional economic activity as a result of each alternative plan. Two measures of the effects of the plan on regional economies are used in the account: regional income and regional employment.

(2) The regions used for RED analysis are those regions within which the plan will have particularly significant income and employment effects. Effects of a plan not occurring in the significantly affected regions are to be placed in a "rest of nation" category.

(3) There are major difficulties in estimating some effects in the RED account. RED effects may be excluded if they cannot be estimated in a sound manner or will not have a material bearing on the decisionmaking process.

(b) *Positive effects on regional economic development.* (1) *Regional income.* The positive effects of a plan on

a region's income are equal to the sum of the NED benefits that accrue to that region, plus transfers of income to the region from outside the region.

(i) *Regional incidence of NED benefits.* Because of the definition of region used for the RED account, all or almost all the NED benefits for the plan should accrue to the regions being analyzed. The NED benefits of a plan that accrue to a region are to be organized in the same benefit categories used in the NED account.

(ii) *Transfers.* (A) Income transfers to a region as a result of a plan include income from: project outlays, transfers of basic economic activity, indirect effects, and induced effects. In each case income transfers refer to increases in income within the region rather than to increases in total expenditure. These increases in income are closely associated with value added by economic activity in the region.

(B) Income from project outlays is that portion of project outlays that become income in the regional economy.

(C) Income from transfers result from shifts in basic economic activity to the region from outside the region. These shifts refer to changes in the location of economic activity between the with and without plan conditions.

(D) Income from indirect effects is regional income resulting from expansion in the production of inputs to industries supplying increased final products and regional exports.

(E) Income from induced effects is regional income resulting from changes in consumption expenditures generated by increases in personal income.

(2) *Regional employment.* (i) The positive effects of a plan on regional employment are directly parallel to the positive effects on regional income, so the analysis of regional employment effects is to be organized in the same categories using the same conceptual bases as the analysis of positive regional income effects. Regional employment associated with each of the regional income categories is to be calculated and listed accordingly.

(ii) To the extent practical planning reports are to provide reasonable estimates of the composition of the increased employment by the relevant service, trade, and industrial sectors, including a separate estimate for agriculture. The nature of the employment increase to each sector is to be classified as to the level of skill required—unskilled, semiskilled, and highly skilled.

(c) *Negative effects on regional economic development.* (1) *Regional income.* The negative effects of a plan on a region's income are equal to the sum of the NED costs of the plan that are borne by the region, plus transfers of income from the region to the rest of the nation.

(i) *Regional incidence of NED costs.* The NED costs of a plan that are borne by a region are to be organized in the same categories used in the cost section of the NED account. Information from the cost allocation and cost sharing analysis undertaken as a part of the planning process will be needed to estimate these direct regional expenditures.

(ii) *Transfers.* Income transfers from the region include income losses from plan-induced shifts of industrial activity from the region to the rest of the nation, losses in existing transfer payments, plus any impacts that may affect the region as a result of NED costs or transfers from the region.

(2) *Regional employment.* (i) The negative effects of a plan on regional employment are to be organized and analyzed using the same categories and conceptual bases used for negative regional income effects (Paragraph (c)(1) of this section).

(ii) The categorization of negative regional employment effects is to be the same as for the positive regional employment effects (Paragraph (b)(2) of this section).

(d) *Relationship between RED and NED effects.* To the extent possible, income information in the RED account is to be organized in the same categories as the NED benefits. The relationship between the affected regional economies and the national economy is to be recognized. Since the NED account registers all effects on the national economy, any differences between the regional and national economic effects of a plan must take the form of transfers from the rest of the nation. The effect of these transfers is to be registered in a "rest of nation" listing. The effects in each category of the rest of nation listing are to be equal to the difference between the RED effects and NED effects of a plan. This rest of nation listing is to be displayed in the RED account together with the RED and NED effects.

§ 711.64 Other social effects account.

(a) *General.* (1) The OSE account registers plan effects from perspectives which are not reflected in the other three accounts. The categories of effects in the OSE account may be the following: urban and community impacts (Office of Management and Budget Circular A–116); life, health, and safety factors; energy requirements and conservation.

(2) Effects are to be evaluated in terms of their impacts on the separate regions and communities affected.

(3) Effects that cannot be satisfactorily quantified or described with available methods, data, and information or will not have a material bearing on the decisionmaking process may be excluded from the OSE account.

(b) *Urban and community impacts.* (1) Urban and community impacts are the impacts listed in Office of Management and Budget (OMB) Circular A–116, which implements Executive Order 12074, Urban and Community Impact Analysis (3 CFR 217). While a formal and detailed Urban and Community Impact Analysis, as defined in OMB Circular A–116, is not required for Level C studies, the specified types and locations of significant impacts are to be reported in the OSE account.

(2) The principal types of urban and community impacts are—

(i) Income, especially that of low income households (as defined in the Comprehensive Employment and Training Act (§3, Pub. L. 95–524, 92 Stat. 1909));

(ii) Employment, especially minority employment;

(iii) Population size and composition;

(iv) The fiscal condition of the State and local governments; and

(v) the quality of urban and community life.

(3) Impacts include direct and indirect effects and are to be reported in both absolute and relative terms.

(4) Impacts are to be reported for the following types of places: central cities; suburban communities; nonmetropolitan communities; distressed cities (as defined by HUD, Office of Urban Development Action Grants); communities with higher than average rates of unemployment; communities with per capita income lower than the U.S. average; and other categories of places considered appropriate.

(c) *Life, health, and safety.* Effects in this category include items such as risk of flood, drought, or other disaster affecting the security of life, health, and safety; and risk of dam failure and potential loss of life, property, and essential public services.

(d) *Energy requirements and conservation.* Effects in this category include items such as use of non-renewable energy resources during construction and operation of facilities; and conservation of non-renewable energy resources.

Subpart G—Displays

§ 711.70 General.

(a) Displays are graphs, tables, and summary statements in a format which facilitates the analysis and comparison of alternative plans. Concise, understandable displays are needed during the planning process and to provide documentation in compliance with NEPA.

(b) Displays are to be prepared to facilitate the analysis and comparison of alternative plans necessary to make the following determinations:

(1) The effectiveness of given plans in solving the problems and taking advantage of the opportunities identified in the planning process.

(2) What must be given up in monetary and nonmonetary terms to enjoy the benefts of the various alternative plans.

(3) The differences among alternative plans in terms of their effects on the NED and EQ objectives and their regional economic development and other social effects.

§ 711.71 Content and format.

The content and format of the displays is to be determined by the planning agency subject to the following requirements:

(a) Displays are to report the present and projected future resource conditions without any of the alternative plans and describe the problems and opportunities related to the planning setting.

(b) Displays regarding candidate plans (§ 711.90) are to include:

(1) Measures in each plan;

(2) Effects in the NED, ED, RED, and OSE accounts; and

(3) Differences between the effects of the recommended plan and the effects of each of the other candidate plans. These differences are to be set forth in a consistent manner so that positive and negative differences in effects are readily discernible.

(c) Alternative plans that were considered but did not become candidate plans are to be briefly described. This description is to include the measures, the effects, and the reasons for their not becoming candidate plans.

Subpart H—Cost Allocation

§ 711.80 General.

(a) Cost allocation is the process of apportioning financial costs among purposes served by a plan. The need for cost allocation among purposes stems from pricing and cost-sharing policies that vary among purposes. Cost allocation among purposes and the apportionment of cost shares to Federal and non-Federal public and private interests are steps in the preparation of RED and OSE accounts.

(b) Financial costs are to be allocated to those purposes served by a plan. Purposes include benefit categories other than external economies and use of otherwise unemployed or underemployed labor resources. All purposes are to be treated comparably.

(c) Financial costs may differ from NED costs. Financial costs may include transfer payments, but do not include associated costs, other direct costs, and external diseconomies.

§ 711.81 Basic concepts.

(a) Separable cost for each purpose in a plan is the reduction in cost that would result if that purpose were excluded from the plan. This reduction in cost will include—

(1) The cost of facilities and activities serving only the excluded purpose; and

(2) Reductions in the cost of facilities and activities serving multiple purposes.

(b) Joint cost is the total cost for a plan minus the sum of separable costs for all purposes.

(c) Remaining benefit for each purpose is the amount, if any, by which the NED benefit for that purpose exceeds the separable cost for that purpose.

§ 711.82 Cost allocation procedures.

The cost allocation procedure is determined by the relationship between joint costs and the sum of remaining benefits for all purposes.

(a) If joint cost is smaller than the sum of remaining benefits for all purposes, costs are to be allocated by a procedure commonly known as the "separable costs—remaining benefits" method. This procedure consists of the following steps:

(1) Estimate NED benefit for each purpose.

(2) Estimate separable cost for each purpose.

(3) Determine remaining benefit for each purpose.

(4) Determine joint cost.

(5) Allocate joint cost among purposes in proportion to remaining benefits.

(6) Determine the total allocation to each purpose by summing for each purpose the separable cost and the allocated share of joint cost.

(b) If joint cost is larger than the sum of remaining benefits for all purposes, the allocation of cost to each purpose is to be—

(1) The larger of separable cost for that purpose or NED benefit for that purpose; and

(2) An additional share of cost assigned by the agency decisionmaker.

§ 711.83 Allocation of component cost.

Cost sharing policies for some purposes pertain to cost components, such as land costs, construction costs, and operation and maintenance costs. An allocation of component cost among purposes by the separable costs—remaining benefits method does not alter the total allocation to each purpose. Costs for each cost component specified in the relevant cost sharing policy are to be allocated among purposes.

§ 711.84 Two-step procedure for determining separable cost.

A two-step procedure for determining separable cost may be used in limited cases where a significant part of total cost is incurred for two or more but not all purposes. Cost separable to two (or more) purposes but not separable to individual purposes may be allocated among the two (or more) purposes in proportion to remaining benefits. The sum by purpose of separable cost and allocated joint cost (joint to the two or more but not all purposes) are then treated as separable cost in allocating total cost among all purposes. The agency decisionmaker is to decide if the cost incurred for two or more but not all purposes is significant enough to justify the effort required for the two-step procedure.

§ 711.85 Use of other methods.

The agency decisionmaker is to use judgment to determine whether or not the prescribed method yields unreasonable results. If the agency decisionmaker judges that it does, he or she may grant an exception to the use of the prescribed method. Such a decision and the reasons for it are to be documented. In such cases, an alternative method that makes a more equitable distribution of costs commensurate with benefits will be used.

Subpart I—Plan Selection

§ 711.90 General

The planning process leads to the identification of alternative plans that could be recommended or selected. These plans are referred to as candidate plans. It is from among these plans that a recommended plan is to be selected. The culmination of the planning process is the selection of the recommended plan to be implemented, or the decision to take no action. The selection is to be based upon a comparison of the effects of alternative plans.

§ 711.91 Candidate plans.

The previous formulation steps including application of the four tests (See § 711.104(e)) should effectively identify the alternative plans that are to be considered as candidates for a recommended plan. The candidate plans should be significantly differentiated from each other, primarily in terms of their emphasis on the NED and EQ objectives; that is, each plan should make a unique contribution to one or both objectives not made by others under consideration. The candidate plans include those required alternative plans specified in § 711.51 (i.e., NED, EQ, nonstructural) as well as other appropriate alternative plans (See § 711.52).

§ 711.92 Selection.

(a) The alternative of taking no action, i.e., selecting none of the alternative plans, is to be fully considered.

(b) Selection of the recommended plan is to be made by the agency decisionmaker for Federal projects and by State and local sponsors for Federally-assisted projects.

(c) The basis of selection is to be fully reported, including considerations used in the selection process. An explicit presentation is to compare the recommended plan to the other candidate plans.

§ 711.93 Net benefits rule.

(a) A recommended plan (when considered individually on the basis of the with-plan versus without-plan comparison) must have combined beneficial NED and EQ effects that outweigh combined adverse NED and EQ effects. For example, a plan lacking net NED benefits may be recommended if net EQ benefits are sufficiently large, even though EQ benefits are not stated in monetary terms.

(b) The Secretary of a Department or head of an independent agency may make an exception to the net benefits rule if circumstances warrant such exception. A decision to make an exception is to be documented and the reasons given.

Subpart J—Planning Process

§ 711.100 Introduction.

The planning process consists of a series of steps that identify or respond to problems and opportunities and culminates in a recommended or selected plan. The process involves an orderly and systematic approach to making determinations and decisions at each step so that the interested public and decisionmakers in the planning organization can be fully aware of the basic assumptions employed, the data and information analyzed, the reasons and rationales used, and the full range of implications of each alternative plan.

§ 711.101 Major steps.

(a) The planning process consists of the following major steps:

(1) Specify the water and related land resources problems and opportunities (relevant to the planning setting) associated with the NED and EQ objectives;

(2) Inventory and analyze water and related land resource conditions within the planning area;

(3) Formulate alternative plans;

(4) Evaluate the effects of the alternative plans;

(5) Compare alternative plans; and

(6) Select a recommended plan based upon the comparison of alternative plans.

(b) Plan formulation is a dynamic process whose various steps should, at a minimum, be reiterated one or more times. This reiteration process, which may occur at any step, may sharpen the planning focus or change its emphasis as new data are obtained or as the specification of problems or opportunities changes or becomes more clearly defined.

§ 711.102 Specification of the problems and opportunities associated with the NED and EQ objectives.

(a) The desire to alleviate problems, realize opportunities, and protect environmental characteristics is to be specified for the planning area in terms of the NED and EQ national objectives (See Subpart C).

(b) The problems and opportunities are to be defined so that meaningful levels of achievement are identified. This will facilitate the formulation of alternative plans in cases where there may be resource, technical, legislative, or administrative constraints to the total alleviation of a problem or realization of an opportunity.

(c) The problems and opportunities are to be stated for both current and future conditions. Desired conditions for the future should be explicitly stated.

(d) The problems and opportunities are to reflect the specific effects that are desired by groups and individuals as well as the problems and opportunities declared to be in the national interest by the Congress or by the Executive Branch. This identification and detailing of problems and opportunities is the process of making explicit the range of preferences and desires of those affected by resource development. It should be understood that the initial expressions of problems and opportunities may be modified during the planning process.

§ 711.103 Inventory water and related land resource conditions within the planning area.

The opportunity to alleviate problems and realize opportunities is determined in the inventory phase. The inventory of resource conditions is to be related to the problems and opportunities previously identified. (See Subpart D.)

§ 711.104 Formulation of alternative plans.

(a) *General.* The alternative plans to be formulated are identified in Subpart E.

(b) *Steps in formulation.* Alternative plans are to be formulated in a systematic manner. The following steps are provided for guidance but may be adjusted for the particular planning setting.

(1) Array problems or opportunities that are essentially complementary, that is, the satisfaction of one of the problems or opportunities does not preclude satisfaction of other problems or opportunities.

(2) Identify relevant alternative measures for alleviating problems or realizing opportunities. An analysis should be made for each alternative measure, including an identification of the beneficial and adverse consequence to other problems and opportunities. The assembly of information on alternative measures will provide a basis for selecting the most effective measure, or combination of measures for satisfying problems and opportunities and for identifying the problems and opportunities that are not satisfied.

(3) Group the measures that are essentially in harmony to satisfy the problems and opportunities. Each set of measures represents the nucleus for an alternative plan.

(4) Formulate the required alternative plans (See § 711.51) and other alternative plans (See § 711.52).

(c) *Implementation schedule.* Formulation should consider the likely schedules of implementation to identify the schedule that would result in the most desirable mix of contributions to the national objectives. Alternative plans should be scheduled for implementation so that desired beneficial effects are achieved efficiently and effectively.

(d) *Increments.* A major increment of an alternative plan is to be included only if the beneficial effects of the proposed increment are judged to outweigh its adverse effects.

(e) *Plan tests.* Alternative plans should be analyzed to determine how well each plan meets the tests of

completeness, effectiveness, efficiency, and acceptability. The results of the tests should be considered by the agency decisionmaker in selecting the recommended plan.

(1) The completeness test determines the extent to which a given alternative plan provides and accounts for all necessary investments or other actions to assure the planned effects. This may require relating the plan to other types of public or private plans if the other plans are crucial to the realization of the contributions to the objectives. Beneficial and adverse effects must be treated comparably when relating water and land resources plans to other plans.

(2) The effectiveness test determines the extent to which a plan alleviates the specified problems and achieves the specified opportunities.

(3) The efficiency test determines whether, among all acceptable alternative measures, (Federal and non-Federal, water and nonwater, structural or nonstructural), the given alternative plan includes the least cost means of alleviating specified problems and realizing specified opportunities associated with the NED and EQ objectives.

(4) The acceptability test is a determination of the workability and viability of the alternative plan in the sense of acceptance by the public and its compatibility with existing laws, regulations, and public policies.

§ 711.105 Evaluation of effects.

(a) *General.* The evaluation of the effects of each alternative plan consists of an assessment and appraisal.

(b) *Assessment.* Assessment is the process of measuring or estimating the effects of an alternative plan. Assessment determines the difference between without-plan and with-plan conditions for each of the categories of effects identified in Subpart F—Accounts.

(c) *Appraisal.* (1) Appraisal is the process of placing social values on the technical information gathered as part of the assessment process.

(2) Since technical data concerning benefits and costs in the NED account are expressed in dollar terms, the NED account already contains a weighting of effects; therefore, appraisal is applicable only to the EQ, RED, and OSE accounts.

(d) *Displays.* The information from evaluation is to be displayed according to the directions provided in Subpart G—Displays.

§ 711.106 Comparison of alternative plans.

(a) The comparision of plans focuses on the differences between the alternative plans as determined from the evaluation phase (See § 711.105).

(b) The differences are to be organized on the basis of the effects in the four accounts. Each plan is compared with other plans.

(c) The comparison of plans usually results in the designation of some of the alternative plans as candidate plans. This designation may be changed based on a refinement of data or analyses, reiteration, expressions of public concern, etc. See § 711.108

§ 711.107 Plan selection.

After consideration of the various alternative plans, their impacts, and after the appropriate reiterations, a plan is selected by the agency decisionmaker following the general guidance in Subpart I.

§ 711.108 Reiteration.

(a) The planning process described in these Principles and Standards is an iterative process in which returning to earlier phases is a key to successful implementation. Reiteration will frequently occur upon completion of the comparison of plans. Among the reasons for returning to an earlier phase at this point, or at any point, are the following:

(1) More detail is needed as basis for selection of a recommended plan;

(2) The consideration of alternative plans reveals significant shortfalls in alleviating the problems or realizing the opportunities of one or both of the objectives;

(3) Information obtained on resource capability and alternative plans suggests that the initial specification of problems or opportunities was in error and requires modification;

(4) Public policy changes occurring during the planning study suggest the need for change in emphasis for the NED or EQ objectives; and

(5) The consideration of alternative plans reveals significant adverse effects.

(b) The above reasons are only suggestive of the need for returning to an earlier planning step. As a general guide, the extent and number of reiterations should be based on a judgment of whether or not new information, further detail, or other changes are likely to result in significant changes in the identified problems or opportunities or in the plans considered.

3. By amending Part 713 as follows:

PART 713—PROCEDURES FOR EVALUATION OF NATIONAL ECONOMIC DEVELOPMENT (NED) BENEFITS AND COSTS IN WATER RESOURCES PLANNING (LEVEL C)

a. Section 713.3 is to be amended by redesignating the existing text of paragraph (b) as paragraph (b)(1) and adding a new paragraph (b)(2) to read as follows:

§ 713.3 Agency activities covered by the manual

* * * * *

(b)(1) * * *

(2) The discretionary authority for project purposes covered under Subparts J and L applies to those projects not yet authorized or for which preauthorization planning is now complete or will be complete by the end of FY 1981 and to those authorized projects requiring post-authorization planning if such planning is now complete or will be completed by the end of the FY 1981. This discretionary authority extension for Subparts J and L may not be exercised after July 31, 1982.

* * * * *

b. By adding Subparts J and L to read as follows:

Subpart J—NED Benefit Evaluation Procedures—Transportation (Deep-Draft Navigation)

Sec.

713.801 Introduction.
713.803 Conceptual basis.
713.805 Planning setting.
713.807 Evaluation procedure.
713.809 Problems in application.
713.811 Report and display procedures.

Authority: Sec. 103, Pub. L. 89–80; 79 Stat. 245; 42 U.S.C. 1962 a–2.

Subpart J—NED Benefit Evaluation Procedures: Transportation (Deep-Draft Navigation)

§ 713.801 Introduction.

This chapter presents the procedure to be followed in measuring the beneficial contributions to national economic development (NED) associated with the deep-draft navigation features of water resources plans and projects. Deep-draft navigation features include construction of new harbors and channels and improvements of existing or natural harbors. Harbor improvements include such structural projects as the construction of breakwaters and jetties to protect exposed harbors and the provision of entrance channels, interior channels, turning basins, and anchorage areas. Nonstructural deep-draft plans consist of such measures as improved traffic management and pilotage regulations.

§ 713.803 Conceptual basis.

The benefits from Federal navigation projects and plans are the gains in national economic efficiency and the increase in the value of output for goods

and services. Principal direct navigation benefits are categorized as follows:

(a) *Transportation benefits.* Specific transportation savings may result from the use of larger vessels; more efficient use of existing vessels; reductions in transit time; lower cargo handling and tug assistance costs; and reduced interest and storage costs from an extended navigation season.

(1) *Cost reduction benefits.* Transportation benefits in the waterborne movement of commodities are the savings in resources from not having to use a more costly alternative means of transportation. Cost reduction benefits are categorized as follows:

(i) *Same commodity, origin-destination, and harbor.* These benefits apply to commodities now moving or expected to move via a given harbor with compared to without the proposed improvement. These benefits apply to existing harbors.

(ii) *Same commodity and origin-destination; different harbor.* These benefits apply to commodities that are now moving or expected to move via alternative harbors without the proposed improvement but that would, with the proposed plan, be diverted through the subject harbor with no change in final origin or destination. These benefits apply to both new and existing harbors.

(2) *Benefits from shifts in the origin and destination of commodities.* The improvement of a harbor may provide economic incentives for the development of commodity sources and points of use and result in traffic movements different from those that would prevail in the absence of the proposed plan. Analysis may indicate that users of the harbor would increase their share of a given market at the expense of other suppliers or users. These benefits apply at both new and existing projects.

(3) *Benefits from induced commodities.* If the proposed plan would induce new traffic that would not be expected without the plan because of prohibitive cost or lack of any available transportation, the resulting benefit can be measured as the delivered price of the commodity minus all associated economic costs.

(b) *Benefits from prevention or reduction of damages.* To the extent that the savings are not otherwise claimed, benefits can be claimed for the prevention or reduction of navigation damages to vessels and shore facilities; cleanup costs; and losses in beneficial uses due to collisions, groundings, and wave damages caused by hazardous or inadequate channel conditions.

(c) *Benefits from advance replacement, operation, and maintenance savings.* Benefits may be claimed when a proposed Federal project includes replacement of existing improvements if replacement would extend the period over which existing benefits would be realized. Benefits may also be claimed if the proposed project would reduce the costs of maintenance and operation of existing improvements unless clear evidence is available that maintenance is unjustified. This type of benefit may be claimed for any project purpose and is not unique to navigation.

(d) *Dredged material utilization benefits.* (1) A new harbor or the modification of an existing harbor often produces incidental land enhancement benefits from the use of the dredged material. This benefit is not unique to navigation and may apply to any project utilizing fill material. A land enhancement benefit is calculated on the basis of the change in market value of the land made usable by the fill material (limited to the cost of equivalent fill). This market value should exclude the impact of the proposed navigation improvement to avoid double counting of benefits.

(2) A similar incidental benefit may result if dredged material has a saleable value for various purposes (e.g., coral and sand).

§ 713.805 Planning setting.

The planning setting consists of the physical, economic and policy conditions that influence and are influenced by a proposed plan or project over the planning period. The planning setting is defined in terms of a without-project condition and with-project condition.

(a) *Without-project condition.* The without-project condition is the most likely condition expected to exist over the planning period in the absence of a plan or any significant change in law or public policy. It provides the basis for estimating benefits for alternative with-project conditions. Assumptions specific to the study are to be stated and supported. The basic assumptions for all studies are:

(1) Nonstructural practices within the authority and ability of port agencies, other public agencies, and the transportation industry will be considered to determine changes that are likely to occur. These practices may consist of reasonably implementable changes in management and use of existing vessels and facilities on land and water. Particular attention should be paid to the attitudes of public agencies and private industries towards the impact, economic efficiency, and acceptability of proposed nonstructural practices. Nonstructural alternatives include, but are not limited to, lightering, tug assistance, use of favorable tides, split deliveries, topping off, alternative ports, and trans-shipment facilities.

(2) Alternative harbor and channel improvements available to the transportation industry over the planning period include those in place and under construction at the time of the study and those authorized projects that can reasonably be expected to be in place over the planning period.

(3) All existing laws and charges required by law will be assumed to remain in effect.

(4) Authorized operation and maintenance will be assumed to be performed in the harbors and channels over the period of analysis unless clear evidence is available that maintenance of the project is unjustified.

(5) In projecting commodity movements involving intermodal movements, sufficient capacity of the hinterland transportation and related facilities, including port facilities, will be assumed unless there is substantive data to the contrary.

(6) A reasonable attempt should be made to reflect advancing technology affecting the transportation industry over the period of analysis. However, the benefits from improved technology should not be credited to the navigation improvement.

(b) *With-project condition.* The with-project condition is the one expected to exist over the period of analyses if a project is undertaken. The with-project condition is to be described for each alternative plan. Since benefits attributable to each alternative will generally be equal to the difference in the total transportation costs with and without the project, the assumptions stated for the without-project condition must be used to establish the with-project condition for each alternative. The alternatives will include a primarily nonstructural plan presented in a manner comparable to structural plans.

(1) Specific nonstructural alternatives for deep ports are generally within the discretion of the private shipper or carrier and therefore are part of the without conditions.

(2) Nonstructural alternatives that are sometimes within the discretion of a public entity and are therefore subject to change in the with condition include, but are not limited to, traffic management, pilotage regulations, addition of berths, and additions or modifications to terminal facilities.

(c) *Display.* The derivation and selection of with and without project conditions shall be clearly presented in

planning reports in accordance with the following guidelines:

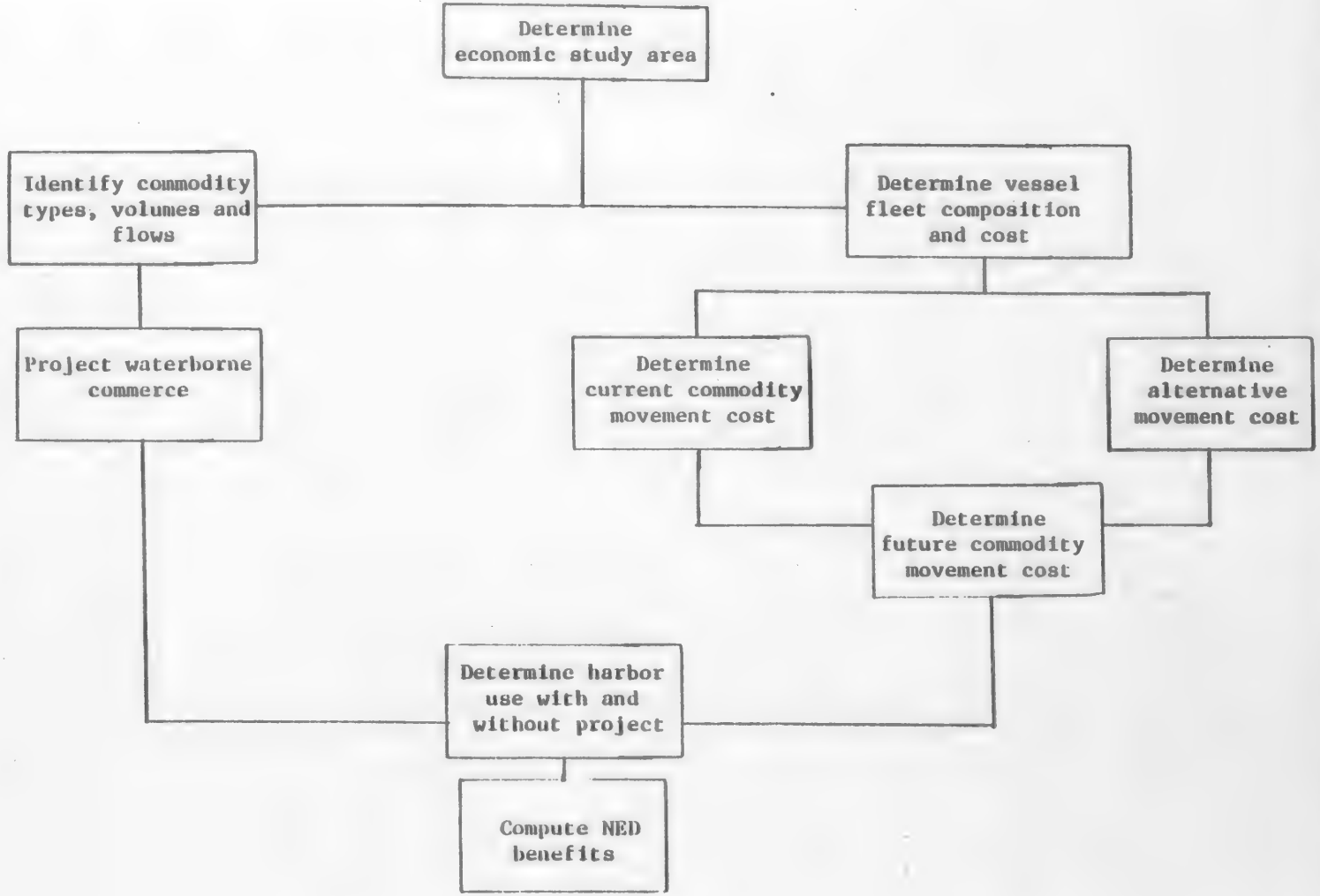
(1) The assumptions specific to the study shall be stated.

(2) The significant technical, economic, environmental, social, and other elements of the planning setting to be projected over the period of analysis will be specified. The rationale for selecting these elements will be clearly discussed.

(3) The with and without project conditions will be presented in appropriate tabular and graphic displays with respect to the elements selected as in paragraph (2) of this section and as exemplified by Tables 1, 4, 5, and 6.

FIGURE 713.807-1

FLOW CHART OF DEEP-DRAFT
NAVIGATION EVALUATION PROCEDURES


Determine economic study area
Identify commodity types, volumes and flows
Determine vessel fleet composition and cost
Project waterborne commerce
Determine current commodity movement cost
Determine alternative movement cost
Determine future commodity movement cost
Determine harbor use with and without project
Compute NED benefits

§ 713.807 Evaluation procedure.

The following steps are used to estimate navigation benefits. The level of effort expended on each step depends upon the nature of the proposed improvement, the state-of-the-art for accurately refining the estimate, and the sensitivity of project formulation and justification to further refinement. A flowchart of navigation evaluation procedures is shown in Figure 713.807–1.

(a) *Step 1—Determine the economic study area.* The trade area that is economically tributary to the proposed harbor and channel improvement must be delineated. An assessment must be made of the types and volumes of commodities being shipped into and out of this trade area. The economic study area is the area within which these commodities will flow via the improvement under study. The delineation and description of the trade area requires a study of the transportation network geographically tributary to the studied improvement in order to determine the area that can be served more economically by the improvement. Diversion from or to adjacent competitive harbors as well as distribution via competing modes of transport must be considered. It should be recognized that the lines of demarcation for the economic study area are not fixed and that the area may expand or contract as a result of innovations or technological advances in transportation and/or production or utilization of a particular commodity. The economic area is likely to vary for different commodities. Combinations of economic areas will result in a trade area delineated specifically for the improvement under study. However, in many cases, due to the close proximity of adjacent harbors to the proposed improvement, the economic study area may be the same as, or overlap with, such adjacent harbors. Therefore, in the final delineation of the trade area for a given improvement, there should be adequate discussion of the trade area relative to adjacent ports and any commonality that might exist.

(b) *Step 2—Identify types and volumes of commodity flow.* To estimate the types and volumes of commodities that now move on the existing project or that may be attracted to the proposed improvement, an analysis must be made of commerce that flows into and out of the economic study area. This analysis results in an estimate of gross potential cargo tonnage; the estimate is refined by successive steps to give an estimate of prospective commerce that may reasonably be expected to use the harbor during the period of analysis in light of existing and prospective conditions. If benefits from economics of ship size are related to proposed deepening of the harbor, generally only a few commodities or types of shipments will be affected. Thus, an historical summary of types and trends of commodity tonnage should be displayed. The steps and considerations generally involved in estimating current volumes of prospective commerce are:

(1) If the plan consists of further improvement of an existing project, statistics on current waterborne commerce will provide the basis for evaluation. For new harbors where there is no existing traffic, or for existing commodity movements that may be susceptible to diversion from adjacent harbors, basic information is collected by means of personal interviews or questionnaires sent to shippers and receivers throughout the economic study area. Secondary commercial data are usually available through State and local public agencies, port records, and transportation carriers. In the case of new movements, attention shall be given to resource and market analyses.

(2) After determining the types and volumes of commodities currently moving or expected to move in the economic study area, it is necessary to obtain origins, destinations, and vessel itineraries in order to analyze the commodity types and volumes that are expected to benefit from the proposed improvement. Commodities that are now moving without the project but that would shift origins or destinations with the project, as well as induced movements, should be segregated for additional analysis (see steps 5 and 6). A study should be made of various alternatives for the existing traffic and of new traffic susceptible to diversion from alternative harbors or other modes of transportation. The objective of such a study is to determine the type and volume of those commodities for which savings could be affected by movement via a proposed navigation improvement and the likelihood that such movements would occur. Savings must be sufficient to divert traffic from established distribution patterns and trade routes. Particular attention should be given to alternative competitive harbors in the case of new movements and to hinterland traffic in determining the likelihood of prospective commerce. Elements to be considered in subjecting the current tonnage to further analysis include, but are not limited to, the following: size and type of vessel, annual volume of movements, frequency of movements, volume of individual shipments, adequacy of existing harbor and transportation facilities, rail and truck connections, and service considerations. As a general rule, this prospective traffic is the aggregate of a large number of movements (origin-destination pairs) of many commodities; the benefit from the navigation project is the savings on the aggregate of these prospective movements.

(c) *Step 3—Project waterborne commerce.* (1) Projections of the potential use of the harbor under study shall be developed for selected years from the time of the study until the end of the period of analysis. Commodity projections shall be set forth and documented for the commodity groups identified in Step 2. The methods used to make the projections must be defensible and must be coordinated with government entities that have expertise concerning the commodities being considered. It may be necessary to use more than one method, depending on the availability of data. For example, OBERS projection data may be found to be inappropriate, and the method for imports is likely to be different from the method of exports. The analyst shall undertake independent studies to ascertain the most appropriate projection methodologies, basing the final choice on an assessment of the available secondary data. These data will assist in delineating the limits on the rate of increase in waterway traffic and facilitate a better understanding of the problem of projections. Secondary data shall be supplemented with (i) interviews of relevant shippers, carriers, and port officials; (ii) opinions of commodity consultants and experts; and (iii) historical flow patterns. Commodity projections shall be constructed on the basis of the results of the independent studies. The projection methodologies selected should be described in sufficient detail to permit a review of their technical adequacy.

(2) Sensitivity analysis of several levels of projections may be needed for the economic analysis. There may be a high level projection embodying optimistic assumptions and a low level projection based on assumptions of reduced expectations. The high and low projections should bracket the most foreseeable conditions. The third and fourth levels of projections can reflect the with- and without-project conditions based on the most likely estimates of the future. If a proposed plan would not induce commodity growth, one level of projection may be shown for both the with- and without-project conditions.

(3) The commodities included in the projections should be identified, if possible, according to the following

waterborne modes: containerized, liquid bulk, dry bulk, break-bulk, etc. Projection-related variables include estimated value, density, and perishability. The commodities should also be categorized by imports, exports, domestic shipments, domestic receipts, and internal trade. Projected tonnages by trade areas both with and without the project should be displayed at least for the study year, the base year, fifth year, tenth year, and then by decades over the period of analysis.

(4) Most projections of waterborne commerce are static estimates of dynamic events; therefore, the projections should be sufficiently current to support the report conclusions.

(d) *Step 4—Determine vessel fleet composition and cost.* (1) *Vessel fleet composition.* A key component in the study of deep-draft harbor improvements is the size and characteristics of the vessels expected to use the project. Data on past trends in vessel size and fleet composition, and anticipated changes in fleet composition over the project life will be presented. Estimates of future fleet will be consistent with domestic and world fleet trends and based on data provided from various sources including, but not limited to, United States Maritime Administration, Office of the Chief of Engineers, trade journals, trade associations, shipbuilding companies, and vessel operating companies. The completed study of the foreign and/or U.S. fleet will be translated to the particular area under study in order to determine the composition of the current and future fleet that would utilize the subject harbor both with and without the proposed improvement. Adequate lead time must be provided for anticipated changes in fleet composition for vessels that are currently a small part of the world fleet. Size selection may vary according to trade route, type of commodity, volume of traffic, canal restrictions, foreign port depths, and lengths of haul. It may not be realistic or acceptable to assume that the optimum size vessel is always available for charter; the preferred approach is a fleet concept that includes a range of vessels expected to call with and without the project. It is suggested that tabulations in the report show composition of vessel fleets by deadweight tonnage for each type of vessel beginning with the current fleet and by decades through the period of analysis. Historical records of trips and drafts of vessels calling at the existing project should also be displayed.

(2) *Vessel operating costs.* To estimate transportation costs, deep-draft vessel operating costs must be obtained for various types and classes of foreign and United States flag vessels expected to benefit from using the proposed improvement. Since vessel operating costs are not readily available from ocean carriers or from any central source, such costs will be developed and provided by the Office of the Chief of Engineers on an annual basis for use in plan evaluation. Planners may determine to what extent, if any, these vessel costs must be modified to meet the needs of local conditions. Selected vessel operating costs will be clearly displayed in the report so that reviewers may compare the costs used in the report with those costs developed and maintained by the Corps of Engineers.

(e) *Step 5—Determine current cost of commodity movements.* Transportation costs prevailing at the time of the study will be determined for all tonnage identified in Step 2. Transportation costs shall include the full origin-to-destination cost, including handling, transfer, storage, and other accessory charges. Costs will be constructed for the with- and without-project condition. The without-project condition will be based on costs and conditions prevailing at the time of the study. Costs with improvement will reflect any efficiencies that can be reasonably expected, such as use of larger vessels, increased loads, reduction in transit time and delays (tides), etc.

(f) *Step 6—Determine current cost of alternative movement.* Transportation costs prevailing at the time of the study will be determined for all tonnage identified in Step 2 for alternative movements. The cost shall include the full origin-to-destination cost. Such alternatives include, but are not limited to, competitive harbors, lightering, lightening and topping-off operations, off-shore port facilities, trans-shipment terminals, pipelines, traffic mangement, pilotage regulations, and other modes of transportation. Competitive harbors with existing terminal facilities and sufficient capacities shall be considered as possible alternatives for traffic originating in or destined to the hinterland beyond the confines of the harbor and for all other new commerce as well as all diverted traffic. Commerce with final origins and destinations within the confines of the study harbor is normally noncompetitive with other harbors and need not be considered for diversion unless unusual circumstances exist. Diversion of established commerce now moving through the existing harbor to or from the hinterland is dependent on many different cost and service factors; therefore, to assure that all of these factors are included in the analysis, interviews and consultations with shippers and receivers should be conducted prior to any determination concerning diversion of traffic. Factors to be considered in the analysis will include, but are not limited to, transportation costs for both inland and ocean movement, handling and transfer charges, available service and schedules, carrier connections, institutional arrangements, and other related factors. In addition, for commodities with shifts in origins and destinations, as well as for new movements, data must be collected on the value of the delivered product as well as production and transportation costs for shipments with the project. The specific data and method of collection will vary with the specific situation and the nature of the benefit.

(g) *Step 7—Determine future cost of commodity movements.* Relevant shipping costs during the period of analysis and future changes in the fleet composition, port delays, and port capacity must be estimated under the with- and without-project conditions for each alternative improvement under study. Future transportation costs will be based on the vessel operating cost prevailing at the time of the study. Additional analysis may be necessary to obtain data on the relationship between total volume and delay patterns and port capacity for the with- and without-project condition for each alternative. Changes in costs due to the project should be identified and separated from changes due to other factors.

(h) *Step 8—Determine project use with and without project.* At this point, the analyst will have a list of commodities that potentially might use the proposed improvement; potential tonnages of each commodity; transportation costs for alternatives and for the proposed improvement; and present and future fleet composition with and without the proposed plan. To project the proposed harbor use over time, both with and without the project, the analyst must compare costs, other than project costs, for movements via the proposed plan and via each alternative. Any changes in the cost functions and demand schedules in the current and future without condition and the current and future with condition must be analyzed. Conceptually, this step should include all factors that might influence a demand schedule. The analyst must determine the impact of uncertainty in the use of the harbor; the level of service provided; and existing

and future inventories of vessels. Adequate lead time for adoption must be provided for vessels that are currently a small percentage of the world fleet.

(i) *Step 9—Compute NED benefits.* Once the tonnage moving with and without a plan is known and the cost via the proposed harbor and via each alternative are known, total NED navigation benefits will be computed using the applicable discount rate.

(1) *Cost reduction benefits.* (i) *Traffic with same commodity, origin-destination, and harbor.* For traffic now using the harbor or expected to use it, in the future, both with and without the proposed project, including future growth, the transportation benefit is the difference between current and future transportation cost for the movement by the existing project (without-project condition) and the cost with the proposed improvement (with-project condition).

(ii) *Traffic with same origin-destination; different harbor.* For commerce shifted to the proposed improvement from other harbors or alternatives, including future growth, the benefit is any reduction in current and future costs when movement via the proposed improvement is compared with each alternative.

(2) *Shift in origin-destination benefits and new movement benefits.* This benefit is the value of the delivered product minus the transportation and production costs with the project (Steps 2 and 6). The benefit must be cross-checked against each currently available production and transportation alternative to ensure that the project causes the changed movement and will be used when built.

(3) *Prevention and reduciton and damages benefits.* Benefits for the prevention or reduction of damages to vessels and shore facilities, cleanup costs, and losses in beneficial uses may be difficult to measure. Direct interview and empirical studies are the most appropriate means of determining past damages and losses. Reduction in collisions, groundings, and damages to shore facilities will be based on the probability of accidents with and without the project. Past damages from collisions and groundings can be used in frequency-damage relationships for claiming benefits.

(4) *Advance replacement and operation-maintenance benefits.* The benefit for advance replacement of existing improvements will be for replacement-in-kind. Replacement that involves improvement will be separately identified. When the operation and maintenance costs of an existing harbor are reduced as a result of a project, benefit equal to savings in cost is creditable to the project.

(5) *Land enhancement and dredged material utilization benefits.* The net benefit from filled land created by disposition of dredged material from the proposed improvement is the net increased market value, limited to the cost of equivalent fill, exclusive of development costs and any additional costs of depositing the dredged material. If the dredged material has salable value, the benefits may be the fair market value of the material.

§ 713.809 Problems in application.

(a) *Multiport analysis.* The procedure in this manual calls for a systematic determination of alternative routing possibilities. The data needed for such a determination are often difficult to obtain; therefore, interviews with knowledgeable experts will often have to be relied upon.

(b) *Ultimate origins and destinations.* The procedure calls for an analysis of full origin-destination costs to determine routings as well as to measure benefits in some instances. Problems will arise in determining the ultimate origins and destinations of commodities and in determining costs. Therefore, the analyst should attempt to shorten the analysis to the most relevant cost items.

(c) *Sensitivity analysis.* Risk and uncertainty must be addressed in the analysis. In dealing with uncertainty, three techniques may be used: establishing consistent sources of data; expanding the data-gathering effort; and estimating the range of benefits. The technique of estimating the range of benefits shall be implemented and the results in terms of effects on project benefits shall be computed and displayed in tabular form in the project report for the following:

(1) *Current tonnage.* Benefits for the recommended alternative shall be computed on the basis of current tonnage.

(2) *Current fleet.* Benefits for the recommended alternative shall be computed on the basis of tonnage over time using current fleet characteristics.

(3) *Growth beyond 20-year period.* Benefits for the recommended alternative shall be computed assuming no growth in tonnage or changes in fleet characteristics beyond 20 years in the future.

(4) *Other.* The report shall contain such other sensitivity analyses as are appropriate.

(d) *Data sources.* The following discussion summarizes key data sources, including problems in their use:

(1) *Interviews.* Data not available from secondary sources shall be collected by personal interviews. (Only interview forms approved by Office of Management and Budget shall be used.) The questionnaire used and a summary of responses shall be compiled and displayed in the project report in such a way that individual sources are not disclosed.

(2) *Publications.* Data concerning commerce in foreign trade, United States coastal shipping, and activities of U.S. flag vessels in foreign trade, together with limited data concerning the world fleet, are readily available from a number of Federal agencies, trade journals, and port publications. However, data concerning the foreign-flag fleet are often not regularly available in up-to-date form from sources in the United States. Principal governmental sources are the U.S. Army, Corps of Engineers, the U.S. Department of Commerce, Maritime Administration and Bureau of the Census. For more detailed background on world fleet trends, shipping outlooks, and vessel characteristics, available foreign literature must be carefully analyzed. A few of the available foreign ship registers and literature are listed below to illustrate the type of data available from foreign sources.

Lloyd's Register of Shipping, London (Annual).
The Tanker Register, H.B. Clarkson (Annual).
The Bulk Carrier Register, H.B. Clarkson (Annual).
Shipping Statistics and Economics (and special reports), H.P. Drewry, Ltd., London (Monthly).
Fairplay International Shipping Journal (and special reports), London (Monthly).

§ 713.811 Report and display procedures.

Clear presentation of study results, as well as documentation of assumptions and steps in the analysis, will facilitate review of the report. The accompanying tables are suggested for all navigations reports. The suggested tables are not intended to limit the number of displays, nor is each of the illustrated displays required in every report. The number of displays will depend on the complexity of the study.

Table 713.811-1.—*Projected Vessel Fleet Size Distribution,*[a] —— *Fort Channel Plan*

[By percentage]

Vessel size (dwt)	Current[b]	Percentage of tonnage				
	Base year[c]	Year 5	Year 10	Year 20	Year-20	Yearend
	With project					
Total						
	Without project					
Total						

[a] Size distribution projections should be made separately, as follows: 1. For foreign and U.S. flag fleets. 2. For vessel types. 3. For trade routes (where distances, constrictions or other circumstances indicated varying sized vessel fleets). 4. For year project plan.
[b] Study year.
[c] First year of project.

Table 713.811-2.—*Typical Vessel Dimension of Vessel Fleet by Type and Deadweight Tonnage*

Type	Vessel characteristics			
	DWT	Length	Beam	Draft, loaded

Table 713.811-3.—*Computation of Annual Transportation Costs*[a] *for* ————

DWT group (000)	Foot channel				Foot channel				Foot channel			
	Tonnage carried		Unit cost	Total cost (000)	Tonnage carried		Unit cost	Total cost (000)	Tonnage carried		Unit cost	Total cost (000)
	Percent	Volume (000)			Percent	Volume (000)			Percent	Volume (000)		
Total												

[a] Similar computations should be included for major commodity movements.

Table 713.811-4.—*Projected Commerce for Deep-Draft Traffic*

Commodity[c]	Current[a]	Base year[b]	Year 5	Year 10	Year 20	Year ——	Year ——	Yearend	Average annual
	With project								
	Without project								

[a] Study year.
[b] First year of project.
[c] Commodities should be categorized by trade area.

Table 713.811-5.—*Projected Vessel Trips for Deep-Draft Traffic*

Vessel type[a]	Current[b]	Base year[c]	Year 5	Year 10	Year 20	Year ——	Year ——	Yearend	Average annual
	With project								
	Without project								

[a] Show projected vessel trips by type of vessel and total for project life.
[b] Study year.
[c] First year of project.

Table 713.811-6. *Project Savings for Deep-Draft Traffic*

Commodity[a]	Current[b]	Base year[c]	Year 5	Year 10	Year 20	Year ——	Year ——	Yearend	Average annual
	With project								
	Without project								

[a] Savings should be shown by commodity and total commerce.
[b] Study year.
[c] First year of project.

Subpart L—Benefit Evaluation Procedures—Commercial Fishing

Sec.

713.1001 Introduction.
713.1003 Conceptual basis.
713.1005 Planning setting.
713.1007 Evaluation procedure: General.
713.1009 Evaluation procedure: Identify the affected areas.
713.1011 Evaluation procedure: Determine the without-project condition.
713.1013 Evaluation procedure: Determine conditions that would exist with an alternative plan.
713.1015 Evaluation procedure: Estimate NED benefits.
713.1017 Problems in application.
713.1019 Evaluation procedure: Data sources.
713.1021 Report and display procedures.

Authority: Sec. 103, Pub. L. 89–80; 79 Stat. 245; 42 U.S.C. 1962 a–2.

Subpart L—NED Benefit Evaluation Procedures: Commercial Fishing

§ 713.1001 Introduction.

(a) This section provides procedural guidance for the evaluation of the national economic development (NED) benefits of water and related land resources plans to commercial fishing. These procedures shall apply to marine, estuarine, and fresh water commercial fisheries for both fish and shellfish.

§ 713.1003 Conceptual basis.

(a) The NED benefits, which include consumer surpluses to commercial fishing from a project or plan, can be measured as the change in the value of output minus the changes in the harvesting costs.

(b) When the projected change in output is too small to affect market price, the value of any change in output can be measured by the change in revenue minus associated costs to primary harvesters. On the other hand, if additional output is expected to affect market prices, the gross value of the change in output can be estimated using a price midway between that expected with and without the plan. (See Section F of Water Resources Council Standards for a graphical depiction of this measure of value.) This gross value measure minus the increase in costs to harvesters will provide an estimate of the value of the increase in production.

§ 713.1005 Planning setting.

(a) *Without-project condition.* The without-project condition is the most likely condition expected to exist in the future in the absence of one of the proposed alternative plans. Several specific element shall be included in the without-project condition:

(1) *Habitat condition.* The biological resources consist of stocks of living resources subject to commercial fishing, any living resources ecologically related to the stocks, the migration pattern and reproduction rate of the stocks, and any physical characteristic of the environment essential to these living resources.

(2) *The institutional setting.* Existing local, State, regional, national, and international policies and regulations governing the harvest and sale of the affected species, including the level of access to the fishery shall be included in the without-project condition. Expected revisions of such policies and rules shall also be included unless policy or rule revision is one of the alternative plans being studied.

(3) *Nonstructural measures.* The effects of implementing all reasonably expected nonstructural methods, including those required or encouraged by Federal, State, and local policies, shall be included. Nonstructural measures may include, but are not limited to, prevention of pollution to the marine environment or changing the temperature or oxygen level of the water.

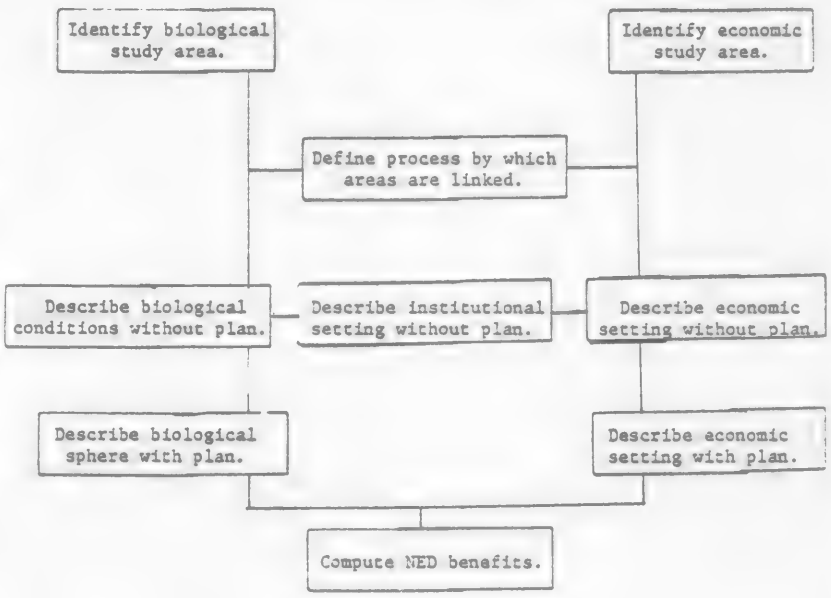
(4) *Market conditions.* The projected number of harvesters, the percentage of their time and capacity utilized, harvest technology, the markets in which they buy inputs, fishing efforts, probable harvests, harbors and channels utilized, and probable processing and distribution facilities shall be included in the without-project condition. Projected market conditions should be consistent with the projected biological and institutional conditions.

(b) *With-project condition* The with-project condition is the most likely condition expected to exist in the future with a given project alternative. The elements and assumptions included in the without-project condition shall also be included in the with-project condition. Special attention should be given to tracing economic conditions related to postive or negative biological impacts of the proposed plan.

§ 713.1007 Evaluation procedure: General.

The steps in §§ 713.1009–.1015 are necessary to estimate NED benefits to commercial fishing from water or related land resources plans. The level of effort to be expended on each step depends on the nature of the proposed project, the reliability of data, and the degree of refinement needed for project formulation and evaluation.

Figure 713.1007–1 Flowchart of Commercial Fishing Evaluation Procedures


Identify biological study area.
Identify economic study area.
Define process by which areas are linked.
Describe biological conditions without plan.
Describe institutional setting without plan.
Describe economic setting without plan.
Describe biological sphere with plan.
Describe economic setting with plan.
Compute NED benefits.

§ 713.1009 Evaluation procedure: Identify the affected areas.

(a) Identify the biological study area which is the ecosystem within which the proposed alternative plans will have impacts on habitat or fishery conditions.

(b) Identify the economic study area which is the economic setting within which the proposed alternative plans will have impacts on the inputs or outputs of the harvesters.

(c) Describe the process by which the biological and economic study areas are linked for those management and development plans that directly or indirectly affect both areas.

§ 713.1011 Evaluation procedure: Determine the without-project condition.

(a) Estimate the harvest of the relevant species in physical terms if a project is not undertaken. Include a detailed description of the stock, including catch per unit of effort and whether or not the projected harvest is at, or near, the range of absolute decreasing returns. (See § 713.1005(1))

(b) Describe the most likely set of institutional conditions that would exist without a project. (See § 713.1005(2).)

(c) Estimate the prices of the relevant species and the total cost of harvesting in each of the relevant years if a project is not undertaken. A weighted ex-vessel price that corrects for seasonal fluctuations should be obtained. (See § 715.1005(4).)

§ 713.1013 Evaluation procedure: Determine conditions that would exist with an alternative plan.

(a) Estimate the harvest of the exploited stocks in each of the relevant years if an alternative plan is undertaken.

(b) Estimate the price of the harvested species and the total cost of harvesting in each of the relevant years if a project is undertaken. This will require an understanding of the economics of entry and exit for the fish harvesting industry, as well as the effects of a change in harvest rates on the catch per unit of effort.

§ 713.1015 Evaluation procedure: Estimate NED benefits.

(a) *Change in gross revenues.* Calculate the differences in the value of changes in output to the harvesters between the without- and with-project conditions for each year for the life of the proposed plan.

(b) *Change in consumer surplus.* The change in consumer surplus is calculated by multiplying the change in output by one-half the expected change in price as a result of the plan.

(c) *Change in associated costs.* Calculate the differences in total harvesting costs between the with- and without-project conditions for each year of the plans.

(d) *Net NED benefits.* The value of the change in output plus the change in consumer surplus minus the change in harvesting cost for each year is the measure of the NED benefits as a result of the proposed plan. The net NED benefit is the present value of the stream of annual benefits.

§ 713.1017 Problems in application.

(a) The fact that fish are common, as opposed to private, property creates special problems in measuring NED benefits. Unless entry is restricted, excessive quantities of capital and labor will enter a fishery; that is, entry will continue until the "economic rent" from the living stock is dissipated. This excess entry will result in economic inefficiency in the utilization of fishery resources because the value of the resulting extra output will be less than the social opportunity cost of the entry. Some economic benefits may be realized but the total benefits will not be as large as they might be if entry were restricted. Although evaluation of this potential has been limited by the specification of the with- and without-project condition in § 713.1005 four specific points are worthy of separate mention.

(1) *Transitory benefits.* Because the benefits from harvesting open-access fisheries tend to be dissipated through entry of excess capital and labor, some NED benefits from commercial fishing can be transitory. It will therefore be necessary to determine how many years these benefits will last and in what amounts for each year. Other benefits may vary over time but will last for the life of the plan.

(2) *Open access.* The fact that open access to a fishery can result in lower net benefits than limited entry can lead to significant problems in interpretation of NED benefits, especially if the project would have a negative effect on the fishery. If an open access fishery is biologically damaged as a result of a project, the financial costs will be less than the potential social costs if the damage to the fishery precludes better management through an institutional change to restricted entry sometime in the future. Therefore, if such management is possible, a theoretical with-without comparison would indicate that the project not only causes direct losses in NED benefits but it also prevents possible gains from proper management through restricting access to the fishery.

(3) *Industry capacity.* The excess capacity that will normally exist will make it difficult to obtain a proper estimate of changes in costs associated with changes in harvests. In some instances, idle boats will be available and the only additional costs will be operating costs. In other instances, vessels that are already operating will be able to harvest the extra catch without significant change in variable costs.

(4) *Regulation.* Because of the tendency of open-access fisheries to attract excess capital and labor which can deplete the stocks, most commercial fishing operations are currently subject to government regulations which stipulate the manner, time, place, etc., in which harvesting may take place. These stipulations usually result in harvesting activity that is not as economically efficient as it might be. These stipulations will therefore affect the size of NED benefits and will, in general, make them smaller than they otherwise would be.

(b) Another important issue is the productivity of the exploited stock. As the harvest rate of living stocks goes up, it is possible to reach a range in which increases in annual harvesting efforts will actually produce a long-run decrease in the quantities harvested. Further, in instances in which there are no restrictions on entry to the harvesting sector, it is possible that commercial

fishing will operate in this range of absolute decreasing returns. This is possible because individual operators will compare only their revenues and costs; they will not be concerned with the absolute productivity of the stock. This can be very important in determining NED benefits because what may appear to be a positive effect (something that encourages an increase in harvesting effort) may ultimately result in negative benefits (decreased total harvest and increased cost per unit of harvest).

§ 713.1019 Evaluation procedure: Data sources.

Data for annual harvests, demand, harvesting and processing costs, ex-vessel and other prices, physical production, biological modeling, models or information about management policies and regulations, and survey results are available from several Federal, State, and local government agencies, universities (especially those with sea grant programs), private organizations (such as industry groups, fishermen unions, or cooperatives), regional fisheries management councils, and international commissions or organizations. Initial contacts should be made with the National Marine Fisheries Service Regional Office, United States Coast Guard, State resource agencies having management or other responsibility for the fishery or resource in question, and all local or regional fishery councils, commissions, or institutes that have responsibility or jurisdiction or that are functioning within the area affected by the project. Fisheries dynamics biologists at universities or at Natural Marine Fisheries Service regional laboratories will be the best source of information on biological effects and their repercussion in the market.

§ 713.1021 Report and display procedures.

Clear presentation of study results, as well as documentation of key input data assumptions and steps in the analysis, will facilitate review of the report. Table 713.1021–1 is a suggested method of data presentation. Its use will provide the reader with information on physical changes in output as well as value. Further, the value data are divided into changes in market value and changes in consumer surplus. As noted in § 713.1003 above, it is possible to combine these two steps by taking the average of expected price before and after project during a year to arrive at a gross value of output. Because the benefits are broken down into annual flows, it will be possible to determine if and when the open access nature of commercial fishing will lead to a dissipation of any NED benefits provided by the project.

Table 713.1021–1.—*Guide to Benefit Calculation*

Years	1	2	n
(1) Change in output			
(2) Market value of change in output (line 1 times expected price).			
(3) Costs associated with change in output.			
(4) Net market value (line 2 minus line 3).			
(5) Changes in consumer surplus			
(6) Net change in value of production (line 4 plus line 5).			

Present value of annual flow of net change in value of production for ——— years at — percent is ———.

4. By adding a new Part 714 to read as follows:

PART 714—ENVIRONMENTAL QUALITY EVALUATION PROCEDURES FOR LEVEL C WATER RESOURCES PLANNING

Subpart A—Introduction

Sec.

714.100 Purpose and scope.
714.110 Authority.
714.120 Agency activities covered.
714.130 Application.
714.140 Modification.
714.150 Judicial review.

Subpart B—Definitions

714.200 Definitions.

Subpart C—General Evaluation considerations

714.300 Introduction.
714.310 Interdisciplinary planning.
714.320 Public involvement.
714.330 Integration of other review, coordination and consultation requirements.
714.340 Significance.
714.350 EQ account.
714.360 Measurement framework.
714.370 Documentation.
714.380 Performance objectives.

Subpart D—Process

714.400 Introduction.
714.410 Scope resources.
714.420 Inventory resources.
714.430 Assess effects.
714.440 Appraise effects.

Authority: Sec. 103 and 402, Pub. L. 89–80, 79 Stat. 245 (42 U.S.C. 1962a–2 and d–1); Sec. 102(2)(b), Pub. L. 91–190, 83 Stat. 852 (42 U.S.C. 4332).

Subpart A—Introduction

§ 714.100 Purpose and scope.

(a) The Water Resources Council (WRC) has developed procedures to provide operational guidance on how to implement the Principles and Standards established by WRC pursuant to Section 103 of the Water Resources Planning Act Pub. L. 89–80; 42 U.S.C. 1962a–2). This part of the procedures is specifically intended to supplement and implement the Standards for the evaluation and display of environmental quality (EQ) effects in water resources planning (Level C).

(b) These procedures provide a systematic method for evaluating the nonmonetary effects of alternative plans on natural and cultural resources to be displayed in the EQ account. The "human environment" cited in the National Environmental Policy Act (NEPA, Pub. L. 91–190) is made up of the full range of resources and values included in the four P&S accounts. Therefore, EQ evaluation by itself will address only the part of the human environment related to the ecological, aesthetic, historic, educational/scientific, and pristine values of natural and cultural resources. Other values, such as the monetary human health, and social values of natural, cultural, and other resources, are to be evaluated in accordance with the appropriate evaluation procedures for the NED, RED, and OSE accounts.

(c) Compliance with these procedures is intended to satisfy the analysis and disclosure requirements of NEPA, and assist agencies in meeting the requirements of NEPA, as specified in the NEPA regulations (40 CFR 1500–1508), with respect to the EQ account. Table 714.100 lists some of the interrelationships between the NEPA regulations and these procedures.

Table 714.100—*Interrelationships Between NEPA Regulations and These Procedures*

Requirements of NEPA regulations (40 CFR 1500–1508)	Related requirements of these procedures (18 CFR 714)
1501.2 Apply NEPA early in the process.	714.400 Early stages of EQ evaluation.
1501.6 Cooperating agencies.	714.310 Members of cooperating agencies on the interdisciplinary team. 714.320 Cooperating agencies as members of the public. 714.410 Cooperating agencies in the Scope Resources Phase.
1501.7 Scoping	714.320 public involvement in EQ evaluation. 714.340 Focus on significant [illegible] 714.410 Identify other institutionally recognized resources to be evaluated.
1502.14 Alternative including the proposed action (section in EIS).	714.420 Forecast "without plans" conditions (No Action alternative). 714.430–440 Substantial and equal analysis of each alternative plan.
1502.16 Environmental consequences (section in EIS).	714.430–440 Identification, description and appraisal of EQ effects of each alternative plan.
1502.25 Environmental review and consultation requirements.	714.330 Integration of other requirements into EQ evaluation.

Table 714.100—*Interrelationships Between NEPA Regulations and These Procedures*—Continued

Requirements of NEPA regulations (40 CFR 1500–1508)	Related requirements of these procedures (18 CFR 714)
	714.410 Use of other, existing requirements in EQ evaluation.
1506.2 Elimination duplication with State and local procedures.	714.410 Integration of resources of State and local importance into EQ evaluation.
1506.6 Public involvement.....	714.320 Public involvement in EQ evaluation. 714.410 Public involvement in the Scope Resources Phase.

§ 714.110 Authority.

(a) The President's July 12, 1978, memorandum: "Planning and Evaluation Standards," stated that reforms were essential to achieve environmental quality in water resources management. It further stated that "too little attention has been paid to environmental values" and directed WRC to publish a planning manual that will ensure that benefits and costs are calculated in compliance with the Principles and Standards.

(b) WRC's authorities for developing these procedures are Sections 103 and 402 of the Water Resources Planning Act (Pub. L. 89–80; 42 U.S.C. 1962a–2 and d), and Section 102(2)(B) of NEPA (Pub. L. 91–190; 42 U.S.C. 4332).

(c) NEPA is the Nation's basic charter for protection of the environment. Section 101 establishes policies and set goals; Section 102 provides means for carrying out the policy. Section 102(2)(B) specifically requires Federal agencies to "Identify and develop methods and procedures. . . which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in discisionmaking along with economic and technical considerations."

§ 714.120 Agency activities covered.

(a) These procedures are to be used for the evaluation of beneficial and adverse EQ effects of Federal and Federally-assisted water resources projects covered in § 711.4 of the Principles and Standards for Planning Water and Related Land Resources. They apply to all Level C (project) planning studies subject to the Principles and Standards, including projects that may be approved by agency administrators; projects requiring congressional authorization; and authorized projects or separable features of authorized projects not yet under construction for which agencies currently prepare postauthorization planning documents. For the purposes of these procedures a project shall be considered "under construction" when funds have been appropriated by the Congress or budgeted by the President for land acquisition or physical construction activity. Projects for which postauthorization planning documents are not required shall be considered under construction when authorized for construction.

(b) The Secretaries of Departments shall retain the discretion to review those projects not under construction and may, under their discretionary authority, wholly exempt a project from complying with these procedures, or partially exempt a project and direct expedited additional planning to meet specific procedures.

(1) This discretionary authority applies to those projects not yet authorized for which preauthorization planning is now complete or will be complete by the end of fiscal year 1981, and to those authorized projects requiring postauthorization planning if such planning is now complete or will be complete by the end of fiscal year 1981. For purposes of these procedures, preauthorization or postauthorization planning shall be considered complete when the appropriate planning documents have been approved by the responsible agency's field office.

(2) Secretarial authority to exempt projects from the procedures is provided to prevent undue loss of the time or expenditure of public funds in those cases in which the Secretary judges additional planning to be unnecessary.

(3) This discretionary authority may not be exercised after July 31, 1982. When this authority is exercised, the decision and reasons for it are to be recorded in the planning document.

(c) Authorized projects exempted from complying with the Principles and Standards are also exempted from complying with these procedures.

§ 714.130 Application.

The administrator of each covered Federal or Federally-assisted program is responsible for applying these procedures. The responsible agency administrator shall adopt these procedures within 30 days after the date of publication as final rules in the **Federal Register.**

§ 714.140 Modification.

To ensure that the best available techniques and accurate and consistent analyses are used, WRC will periodically supplement these procedures with specific measurement techniques as the state of the art advances, and revise these and subsequently adopted procedures as experience, research, and planning conditions dictate.

§ 714.150 Judicial review.

The Water Resources Council's intent is that judicial review of agency compliance with these procedures not occur before an agency has filed a final environmental impact statement, or has made a final finding of no significant impact (in compliance with NEPA), or initiates action that will result in irreparable injury. Further, it is WRC's intent that trivial violation of these procedures not given rise to any independent cause of action.

Subpart B—Definitions

§ 714.200 Definitions.

Alternative plan. An alternative plan consists of structural and/or nonstructural measures that alleviate particular problems or take advantage of specific opportunities associated with water and related land resources in the study area. As used in these procedures, "alternative plans" includes individual measures and combinations of measures.

Effect. An effect is the difference between the specific without-plans and with-plan condition of an EQ resource under a given alternative plan, as measured or estimated by quantity and quality indicators.

EQ resource. An EQ resource is a specific identifiable natural or cultural form, process, or other phenomenon (including those related to land, water, atmosphere, plants, animals, and cultural objects, sites, buildings, structures, and districts) that:

(a) Is located in a specified study area;

(b) Is significant based on institutional or technical criteria or public concern; and

(c) Possesses one or more EQ values.

Guideline. A guideline is a standard, criterion, threshold, optimum level, or other desirable level for a quantity or quality indicator that provides a basis for judging whether an effect is beneficial or adverse. For example, a guideline for the quality indicator "carrying capacity" may be "between one and two quail/acre."

Indicator. An indicator is a measurable attribute of an EQ resource that specifies resource characteristics for which data will be collected. Two types of indicators are used in EQ evaluation. Quantity indicators, such as area and distance, are used to measure the physical dimensions of a resource. Quality indicators, such as carrying capacity and visual diversity, are used

to directly measure or estimate a resource's EQ values.

Period of analysis. The period of analysis is the time horizon for beneficial and adverse effects of alternative plans. The period of analysis will be the lesser of the period of time over which alternative plans can reasonably be expected to serve a useful purpose, or a period not to exceed 100 years. For purposes of EQ evaluation, the period of analysis is to include the installation period during which alternative plans would be implemented.

Study area. The study area is a geographic space with an identified boundary that includes the area identified in the study's authorizing document; the locations of resources included in the study's identified problems and opportunities; the locations of alternative plans, often called "project areas"; and the locations of resources affected by alternative plans. The study area for EQ evaluation is to be synonymous with the study area defined in the planning process.

With-plan condition. The with-plan condition is an estimation of the most probable future conditions of an EQ resource expected to result from implementation of a specific alternative plan formulated during the study.

Without-plans condition. The without-plans condition is an estimation of the most probable, future condition of an EQ resource in the absence of any of the study's alternative plans. The without-plans condition is synonymous with the No Action alternative required by regulations of the Council on Environmental Quality (CEQ) implementing the procedural provisions of NEPA (40 CFR 1502.12).

Subpart C—General Evaluation Considerations

§ 714.300 Introduction.

(a) EQ evaluation is a set of activities and their aggregate outcomes that is necessary to identify, describe, and appraise the effects of alternative plans on significant natural and cultural resources. Its purpose is to identify the beneficial and adverse effects of alternative plans on EQ resources so that agency decisionmakers can appraise the net effects of the plans. The interaction of EQ evaluation with the planning process is intended to emphasize enhancement and avoid degradation of EQ resources.

(b) EQ is one of the four accounts in which the effects of alternative plans are to be evaluated. Taken together, these four accounts—EQ, National Economic Development (NED), Regional Economic Development (RED), and Other Social Effects (OSE)—encompass the "human environment" cited in NEPA and CEQ's regulations implementing NEPA's procedural provisions (40 CFR 1500–1508).

§ 714.310 Interdisciplinary planning.

(a) Interdisciplinary planning is the approach to decisionmaking in which professionals with specific expertise in subjects requiring analysis for a particular study are involved in each step of the planning process. The involvement of these experts, hereinafter referred to as "planners," ensures that the best appropriate information is included in and has a material bearing on the decisionmaking process. Interdisciplinary planning is required by the P&S and NEPA, and is emphasized in EQ evaluation.

(b) Like the overall water resources planning process, EQ evaluation necessitates the use of an interdisciplinary approach to deal effectively with the wide range of natural and cultural resources encompassed by EQ. In addition to professionals in the planning agency, interdisciplinary planning includes participation by experts and professionals in cooperating agencies where necessary knowledge and skills are not immediately available in the planning agency.

§ 714.320 Public involvement.

(a) Many Federal policies on water resources planning require the involvement of individuals and groups, including representatives of other Federal and non-Federal agencies. Specific public involvement procedures vary among agencies but generally include provisions for primary contact through meetings, hearings, or workshops, and secondary contact through letters of comment on study documents and other means.

(b) The intent of public involvement is inherent in some specific processes and procedures not usually included in traditional agency approaches to public involvement programs. For example, many Federal policies related to EQ have been implemented by procedures that require a specific type of review, coordination, or consultation between planning agencies and agencies with custodial responsibilities for certain EQ-related factors. Such procedures include the "NEPA process" pursuant to NEPA, the "Section 7 consultation process" pursuant to the Endangered Species Act; the "Section 106 procedure" pursuant to the National Historic Preservation Act; the Coordination Act report" pursuant to the Fish and Wildlife Coordination Act; and the "consistency determination" pursuant to the Coastal Zone Management Act. In addition, CEQ's regulations implementing NEPA require that planning (lead) agencies request the participation of other (cooperating) agencies with jurisdiction by law or special expertise early in the NEPA process and during the scoping process (see NEPA regulations, 40 CFR 1501.6–1501.7). Those procedures further supplement the NEPA mandate for interdisciplinary planning by ensuring that the expertise and views of cooperating agencies be an integral part of the lead agency's planning.

(c) EQ evaluation requires the involvement of many public groups and individuals to meet several objectives. First, the public is a source of information in identifying and measuring EQ resources, collecting and developing data on EQ resources, appraising significant effects, and meeting other requirements when the knowledge and opinions of others are needed. Second, as a reviewer of the results of EQ evaluation, the public will have opportunities to ensure that their views have been properly incorporated into analyses; to understand the implications of their views concerning the significance of resources and effects and the beneficial and adverse effects of alternative plans; and to react to evaluation results in such a way that alternative plans may be modified in reformulation.

§ 714.330 Integration of other review, coordination, and consultation requirements.

To the fullest extent possible, EQ evaluation is to be conducted concurrently and integrated with the documentation, studies, and analyses required by other environmental review, coordination, and consultation mandates and procedures, including but not limited to those related to NEPA, the Endangered Species Act, the National Historic Preservation Act, the Fish and Wildlife Coordination Act, and the Coastal Zone Management Act. Documentation, studies, and analyses based on these requirements and EQ evaluation should be complementary to avoid duplication.

§ 714.340 Significance.

EQ evaluation will focus on issues that are significant, that is, that are likely to have a material bearing on the decisionmaking process. The decisionmaking process includes EQ evaluation, planning, and all other related processes leading ultimately to implementation of a plan. In EQ evaluation, significance is attributable

to both resources and effects. Insignificant issues will not be included in evaluation, but such issues may be reintroduced if they are later demonstrated to be significant.

§ 714.350 EQ account.

The EQ account includes natural and cultural resources that possess one or more EQ values, which are the nonmonetary qualities of natural and cultural resources of utility to man. EQ values are:

(a) Ecological value, which is attributable to natural resources that do or could support or provide the food, water, cover, reproduction, space, and other life requirements of plant and animal populations and communities. The Grey Lodge Wildlife Area and the Chesapeake Bay great blue heron rookery are examples of resources with ecological value.

(b) Aesthetic value, which is attributable to views, sounds, scents and other perceptual stimuli of natural and cultural resources that do or could provide diverse and pleasant surroundings for human enjoyment and appreciation. A view of the South Branch Valley and the sound of Blackwater Falls are examples of resources with aesthetic value.

(c) Historic value, which is attributable to natural resources and cultural places and objects that have played a special role in, or contain an account of, the course of human activity. The Seneca Trail and the Red Rock cliff dwellings are examples of resources with historic value.

(d) Educational and scientific value, which is attributable to natural and cultural resources that convey an understanding of how and why things occur or took place, or have a potential for future educational or scientific use. The Tuscaroara Sandstone formation and the restored Trading Post settlement are examples of resources with educational and scientific value.

(e) Pristine value, which is attributable to natural resources that provide the opportunity to experience conditions essentially unaltered by man's activities or substantially recovered from prior human influence. The Emigrant Basin Wilderness Area and the Blackwater Canyon are examples of resources with pristine value.

§ 714.360 Measurement framework.

(a) EQ evaluation requires the measurement of effects of alternative plans on the quantity and quality of natural and cultural resources.

(b) Effects on the quantity of natural and cultural resources are measured in terms of physical dimensions, such as acres, miles, etc. Effects on resource quantities are determined by measuring differences between the with-plan and without-plans conditions for such physical dimensions.

(c) Effects on the quality of natural and cultural resources are measured in terms of the resources' ecological, aesthetic, historic, educational/scientific, and pristine values. Changes in these values are estimated by measuring the difference between the with-plan and without-plans conditions of quality indicators.

(d) Determination of an alternative plan's beneficial and adverse effects results from consideration of changes in the quantity and quality of natural and cultural resources.

§ 714.370 Documentation.

(a) A study's EQ evaluation is to be documented in such a way that an independent reviewer can fully and clearly understand the decisions that were made and the reasons for making them. Documentation should be clear, concise, and effective in communicating its contents.

(b) Data collected by field sampling, laboratory experiments, interviews, literature searches, and other means are to be documented to include:

(1) Date and place of data collection;

(2) Name of person(s) who collected the data;

(3) Techniques and methods used, including assumptions;

(4) Known or suspected factors that could affect the accuracy of data collection methods, including gaps in relevant information and scientific uncertainty;

(5) Data collected; and

(6) Interpretations of the data.

(c) Data collected prior to initiation of an EQ evaluation that is referenced or incorporated in the EQ evaluation will be documented as described in paragraph (b) of this section to the extent practical.

(d) The reasons and bases for action, decisions, and results required in the EQ evaluation activities are to be documented in an appropriate form. Narrative statements, ranging from short notes to extensive description, are appropriate for most documentation needs. Other formats that may be used are: maps, including composites and overlays; graduated scales, including time lines; graphs; lists; tables; scale models; sound recordings; photographs; films; conceptual drawings; and other formats that accurately record information.

§ 714.380 Performance objectives.

Performance objectives are statements of intent for the EQ evaluation process, and serve as guides to planners in making decisions on how to carry out and document EQ evaluation. EQ evaluation and its documentation are to:

(a) Be generally understandable to members of the public interested in the evaluation.

(b) Be accessible to members of the public interested in participating in the evaluation.

(c) Be traceable so that members of the public interested in knowing the bases and events that led to decisions can follow these factors through the process.

(d) Focus on identification, measurement, and appraisal of significant effects on EQ resources.

(e) Result in information that will be useful to making decisions in advancing the planning process.

(f) Include only the level of detail necessary for reasonable accuracy of measurements, estimates, and other descriptions needed in making decisions.

(g) Be based on scientifically valid and acceptable precepts to the extent practical.

Subpart D—Process

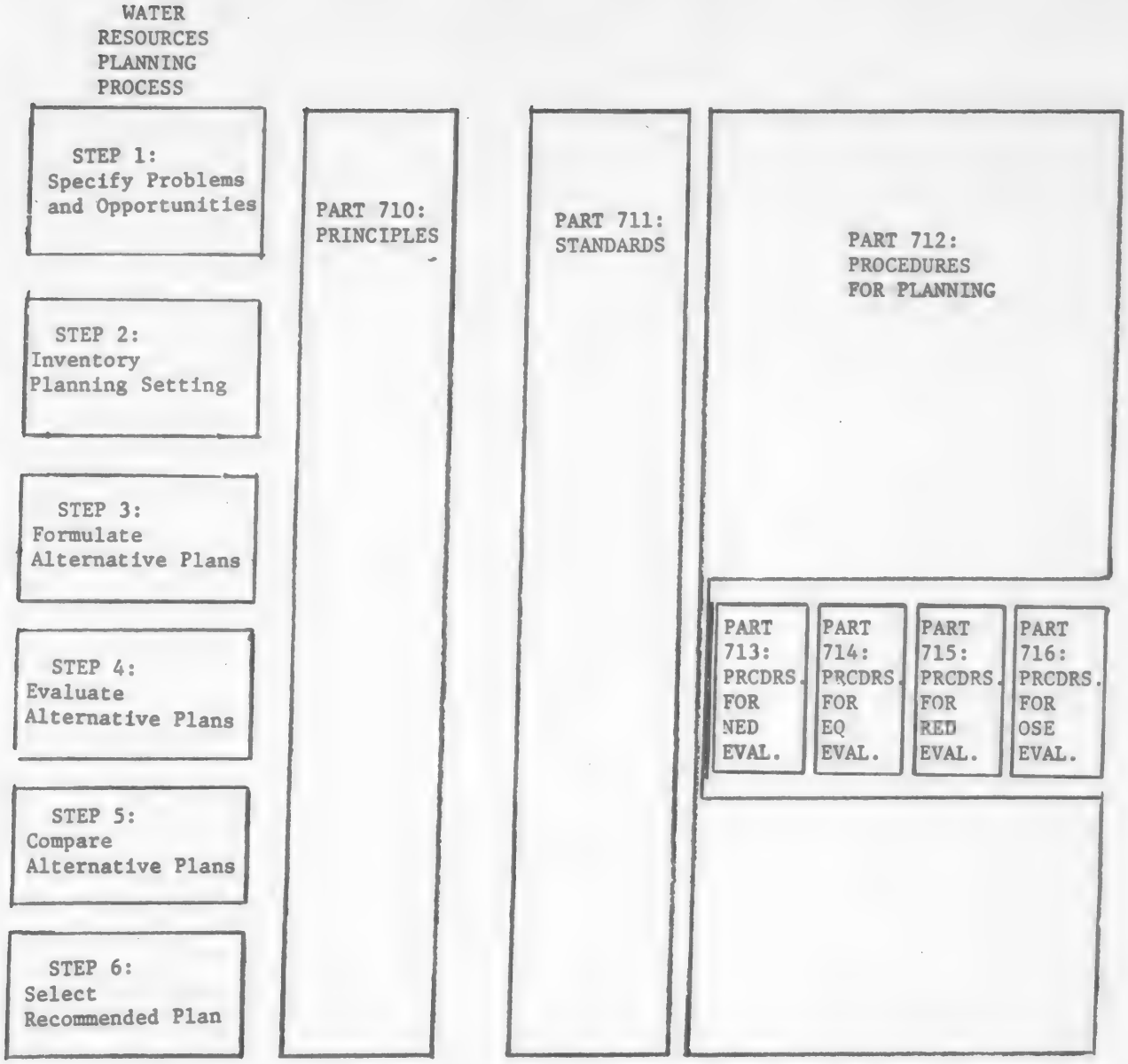
§ 714.400 Introduction.

(a) *Purpose.* The purpose of EQ evaluation is to identify beneficial and adverse effects of alternative plans on EQ resources. The EQ evaluation process described in this subpart is to be used to achieve this purpose.

(b) *Relationships to Planning Process.* (1) EQ plays two roles in water resources planning. First, as a National Objective it is a basis for identifying problems and opportunities, and formulating alternative plans which emphasize resolution of EQ-related problems and realization of EQ-related opportunities. In this capacity, it is also equal with NED in judging the net effect of alternative plans as a basis for plan recommendation. See Part 712, Planning Procedures (to be published) for a more detailed discussion of this aspect of EQ in water resources planning. Second, EQ is one of the four P&S accounts in which effects of alternative plans are to be evaluated and displayed. Taken together, these four accounts of EQ, NED, RED, and OSE encompass the "human environment" cited in NEPA. The EQ procedures contained herein are to be used for evaluating effects in the EQ account. Procedures for evaluating effects in the NED, RED, and OSE accounts are presented in Parts 713, 715 and 716, respectively (Parts 715 and 716 to be published). See Figure 714.400–1 for a graphic presentation of these relationships.

Figure 714.400-1

Relationships Between Planning Process and Coverage in the Principles, Standards and Procedures


WATER RESOURCES PLANNING PROCESS
STEP 1: Specify Problems and Opportunities
STEP 2: Inventory Planning Setting
STEP 3: Formulate Alternative Plans
STEP 4: Evaluate Alternative Plans
STEP 5: Compare Alternative Plans
STEP 6: Select Recommended Plan
PART 710: PRINCIPLES
PART 711: STANDARDS
PART 712: PROCEDURES FOR PLANNING
PART 713: PRCDRS. FOR NED EVAL.
PART 714: PRCDRS. FOR EQ EVAL.
PART 715: PRCDRS. FOR RED EVAL.
PART 716: PRCDRS. FOR OSE EVAL.

NOTE: Although focused on planning step 4, procedures in evaluation parts (713-716) also include certain necessary requirements related to other planning steps.

(2) In its role as an evaluation account, EQ and the other P&S evaluation procedures comprise the procedures for evaluating alternative plans (Step 4 of the planning process). While evaluation can be seen as a distinct increment in the planning process, it is important that evaluation is not seen as an end in itself. Rather, evaluation is to be viewed in the context of its relationships to the other planning steps, particularly Formulate Alternative Plans (Step 3) and Compare Alternative Plans (Step 5). Repetition of the Step 1–2–3–4–5 sequence is the essence of plan formulation and reformulation. Using information from inventorying (Step 2), alternative plans are formulated (Step 3), and evaluated (Step 4) to describe intended and unintended effects. Effects of alternative plans on EQ, NED, RED, and OSE are compared (Step 5) to identify which plans would result in the greatest beneficial effects, and least adverse effect. Subsequently, based on this comparison, some plans may be eliminated; others would be reformulated by changing plan measures to improve intended beneficial effects and diminish adverse effects. Other plans may be added to address new problems and opportunities. Reformulated plans are again compared to further narrow the range of approaches. Additional repetitions of the five steps will eventually produce a set of plans from which a recommended plan can be selected (Step 6).

(c) *Evaluation phases.* (1) While evaluation is comprised of assessment and appraisal of effects, the EQ evaluation process described in these procedures also includes the necessary scoping and inventorying that are preparatory to assessment and evaluation. Therefore, EQ evaluation is to be performed in the following four phases:

(i) Scope Resources—this phase defines the resources and measurements for EQ evaluation.

(ii) Inventory Resources—this base builds a data base for EQ evaluation.

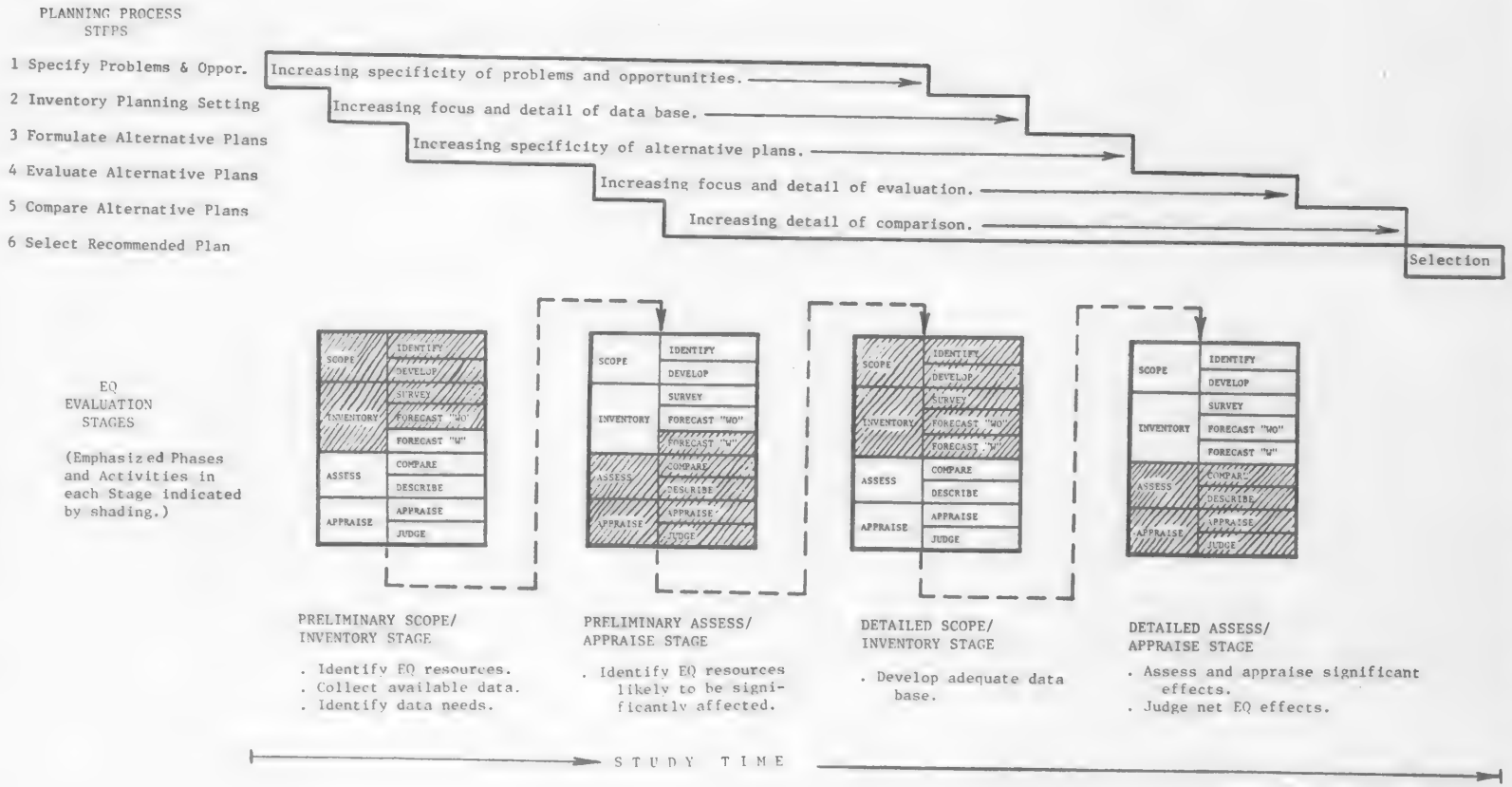
(iii) Assess Effects—this phase identifies and describes the physical and value dimensions of the significant effects of alternative plans on EQ resources.

(iv) Appraise Effects—this phase identifies and describes the desirability of the effects of alternative plans on EQ resources.

(2) Although these phases are presented linearly here, many interrelationships exist among these phases and their activities. Planners may have to repeat phases and activities in stages to complete a given EQ evaluation.

(d) *Evaluation stages.* (1) Planners are to conduct EQ evaluation in several stages, performing and repeating evaluation phases and activities in increasing levels of detail, each level commensurate with the evaluation needs of the overall planning effort. The level of detail and number of stages will vary with each planning study, but the following stages, shown graphically in Figure 714.400–2, should be considered for every study:

Figure 714.400-2
Relationship Between Planning-Process Steps and EQ Evaluation Phases and Stages



(i) Early in the planning, a preliminary scope and inventory stage should be used to identify EQ resources and measurements, and to collect readily available data. This stage should emphasize the Scope Resources phase to provide a focus for evaluation and to reveal data collection and forecasting needs for the Inventory Resources phase. Early identification of EQ resources will also be helpful in identification of resources for which problems and opportunities are specified to enhance the EQ objective.

(ii) Following the preliminary formulation of conceptual alternative plans, a preliminary assess-and-appraise stage should be used to identify EQ resources likely to be affected. This stage should emphasize the Assess Effects phase, further focusing data needs by identifying those resources that would be beneficially or adversely affected, intentionally or unintentionally, by each of the alternative plans. The assessment and appraisal of effects at this stage will help identify alternative plans in terms of their enhancement and degradation of EQ resources, thereby providing bases for futher reformulations in Steps 3 through 5 of the planning process.

(iii) During the formulation of specific alternative plans, a detailed scope-and-inventory stage should be used to develop an adequate data base for the detailed assessment and appraisal of effects. This stage should emphasize the Inventory Resources phase, including completion of data collection programs and forecasting activities.

(iv) Following final formulation of specific alternative plans, a detailed assess-and-appraise stage should be used to identify, describe, and appraise significant effects and appraise the net EQ effect of each alternative plan. This stage should emphasize the Assess Effects and Appraise Effects phases to provide the agency decisonmaker with reasonable bases for judging net EQ effects. The results of this appraisal, considered jointly with the outcome of concurrent NED evaluation of the same alternative plans, will form the basis for plan selection in Step 6 of the planning process.

(2) Repeating phases and activities in stages of increasing levels of detail should aid in focusing on those EQ resources and effects that will play a role in decisionmaking, rather than on resources unrelated to or not affected by alternative plans.

§ 714.410 Scope resources.

The Scope Resources phase is performed to define the resources and measurements to be used in a study's EQ evaluation. In the first scoping activity, natural and cultural resources to be evaluated are identified on the basis of their presence in the study area, their likelihood of being affected by an alternative plan, EQ values, and significance. Resources with these characteristics are to be further evaluated. In the second scoping activity, a framework for measuring the quantity and quality of identified EQ resources is developed.

(a) *Identify EQ resources.* (1) This activity is performed to identify the specfic natural and cultural resources that would be likely to have a material bearing on the decisionmaking process if they were affected by an alternative plan. The resources identified will be analyzed in later EQ evaluation activities.

(2) Existing Federal mandates recognize many nationally important natural and cultural resources. As a minimum, the EQ values of the types of resources listed in column 1 of Table 714.410–1 will be identified and evaluated in all EQ evaluations in accordance with the procedures listed in column 4 of the table. Fish and wildlife resources, endangered species, cultural resources, wetlands, and floodplains located in the study area are to be identifed and evaluated in accordance with established procedures of other Federal agencies, pursuant to statutory authority, listed in column 4 of the table. Evaluations performed in accordance with those established procedures will also conform, to the extent practical, with the scoping, inventorying, assessment, and appraisal procedures described here, and will provide information suitable for the display required by § 714.440 (a)(4). Other resources listed in column 1 of Table 714.410–1 will be identified in accordance with the NEPA regulations; scoping process (40 CFR 1501.7) and evaluated in accordance with the procedures of this part.

Table 714.410–1.—*Resources Required To Be Evaluated*

Col. 1 Types of EQ resource required to be evaluated	Col. 2 Source of national recognition	Col. 3 Source for identification of specific resources	Col. 4 Procedures for identification and evaluation of resources	Col. 5 Quantitative measurement of resources (indicator/unit/guideline)
Fish and wildlife habitat	Fish and Wildlife Coordination Act (16 U.S.C. Sec. 661 *et seq.*).	Coordination with Fish and Wildlife Service, National Marine Fisheries Service, and State fish and wildlife agency in accordance with 50 CFR 410 (proposed rules).	50 CFR 410, Fish and Wildlife Coordination Act, Uniform Procedures for Compliance: Department of the Interior, Office of the Secretary and Department of Commerce, National Oceanic and Atmospheric Administration (proposed rules).	Area of each habitat type/acres/preservation and enhancement.
Endangered species critical habitat.	Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).	50 CFR 17.11, List of Endangered and Threatened Wildlife and Plants, Department of the Interior, Fish and Wildlife Service; and coordination with Fish and Wildlife Service and National Marine Fisheries Service in accordance with 50 CFR 402.01–402.05.	50 CFR 402.01–402.05, Interagency Cooperation Regulations: Department of the Interior, Fish and Wildlife Service and Department of Commerce, National Marine Fisheries Service.	Area of each critical habitat/acres/preservation and enhancement.
Cultural resources (archeological, historic, architectural and scientific resources).	National Historic Preservation Act of 1966 (16 U.S.C. Sec. 470 *et seq.*).	National Register of Historic Places, and coordination with State Historic Preservation Officer in accordance with 36 CFR 800.	36 CFR 800, Protection of Historic and Cultural Properties, Final Amendments: Advisory Council on Historic Preservation; 36 CFR 60, Criteria for Evaluation, National Register of Historic Places, Department of the Interior, Heritage Conservation and Recreation Service.	Presence of each National Register property/present-absent/preservation and restoration.

Table 714.410–1.—*Resources Required To Be Evaluated*—Continued

Col. 1 Types of EQ resource required to be evaluated	Col. 2 Source of national recognition	Col. 3 Source for identification of specific resources	Col. 4 Procedures for identification and evaluation of resources	Col. 5 Quantitative measurement of resources (indicator/unit/guideline)
Wetlands	Executive Order 11990, Protection of Wetlands Clean Water Act of 1977.		40 CFR 230, Section 404(b)(1) Evaluation Guidelines: Environmental Protection Agency (Applicable only to dredge and fill actions).	Area of each wetland type/acres/preservation and enhancement.
Floodplains	Executive Order 11988, Floodplain Management.	Coordination with Federal and State agencies listed in Table 1, 43 FR 6030.	43 FR 6030, Floodplain Management Guidelines for Implementing E.O. 11988: U.S. Water Resources Council.	Area of each floodplain/acre/preservation and enhancement.
Prime and unique farmland	CEQ Memorandum of August 30, 1976: Analysis of Impacts on Prime and Unique Farmland in Environmental Impact Statements.	Coordination with Department of Agriculture, State Land Use Committee.	40 CFR 1501.7 "Scoping," Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act: Council on Environmental Quality for identification of EQ resources; and 18 CFR 714, Procedures for Evaluating Environmental Quality Effects: U.S. Water Resources Council for evaluation of EQ resources.	Area of prime and unique farmland/acres/preservation and enhancement.
Areas of particular concern within the coastal zone.	Coastal Zone Management Act of 1972 (16 U.S.C. 1451 *et seq.*).	Coordination with State agency with coastal zone management responsibilities.	Same as above	Area of each area of particular concern/acres/preservation and enhancement; or presence of each area of particular concern (e.g., for historic sites)/present-absent/preservation and enhancement.
Wild and scenic rivers	Wild and Scenic Rivers Act (16 U.S.C. 1271 *et seq.*).	Coordination with Department of the Interior and Department of Agriculture.	Same as above	Length of wild, scenic and recreational river/river-miles/preservation.
Water (quality)	Clean Water Act of 1977, (33 U.S.C. 1251 *et seq.*).	Coordination with Environmental Protection Agency and State agency with water quality responsibilities.	Same as above	Flow in water courses, or area of water body/cubic feet per second (cfs), or acre-feet/preservation or improvement in flow or area with respect to applicable water quality standards.
Air (quality)	Clean Air Act, as amended (42 U.S.C. 7401 *et seq.*).	Coordination with Environmental Protection Agency and State agency with air quality responsibilities.	Same as above	Area/square-miles/preservation or improvement in area with respect to applicable air quality standards.

(3) Many other natural and cultural resources are recongized for their national, State, regional, or local importance. Therefore, as a minimum, agencies shall use the NEPA scoping process (40 CFR 1501.7) to provide other agencies, groups, and individuals the opportunity to identify other natural and cultural resources which are important for decisionmaking purposes based on the following criteria:

(i) The resource is partially or fully located in the study area;

(ii) The resource is likely to be affected by one or more alternative plans;

(iii) The resource possesses or could possess one or more material EQ values; and

(iv) The resource is significant based on institutional, public, or technical recognition.

(4) Significance based on institutional recognition means that the importance of a resource is acknowledged in the established laws, adopted plans, and other legal instruments of public agencies or private groups. Sources of institutional recognition include:

(i) Public laws, executive orders, and regulations, as well as other legal instruments of the Federal government not listed in Table 714.410–1.

(ii) Laws, directives, plans, regulations, and other legal instruments of States with jurisdiction in the study area. Examples are State water and air quality regulations, State historic preservation plans, and State lists of rare, threatened, or endangered species.

(iii) Laws, plans, codes, ordinances, and other legal instruments of regional and local public entities with study area jurisdictions. Regional entities include river basin commissions, councils of government, and regional planning boards. Local entities include counties, districts, parishes, cities, towns, and villages. Examples of sources are regional open space plans, county lists of historic sites, and town zoning ordinances.

(iv) Charters, bylaws, and formal policy statements of nongovernment environmental entities. Examples are the National Audubon Society Blue List of Species, properties of the National Trust for Historic Preservation, and properties of the Nature Conservancy.

(5) Significance based on public recognition means that some segment of the general public recognizes the importance of a resource. Public recognition may take the form of controversy, support, conflict, or opposition and may be expressed formally, as in official letters, informally, or merely implied. Environmental-related customs and traditions of people in the study area are also to be considered. Resources recognized by the public will vary among study areas and often change over time.

(6) Significance based on technical recognition means that the importance of a resource is based on scientific

knowledge of factors critical to its existence. Factors that may be considered include resource scarcity, fragility, resiliency, reproducibility, tolerance, stability, productivity, diversity, and integrity. Technical factors will vary among resources and study areas and may change over time.

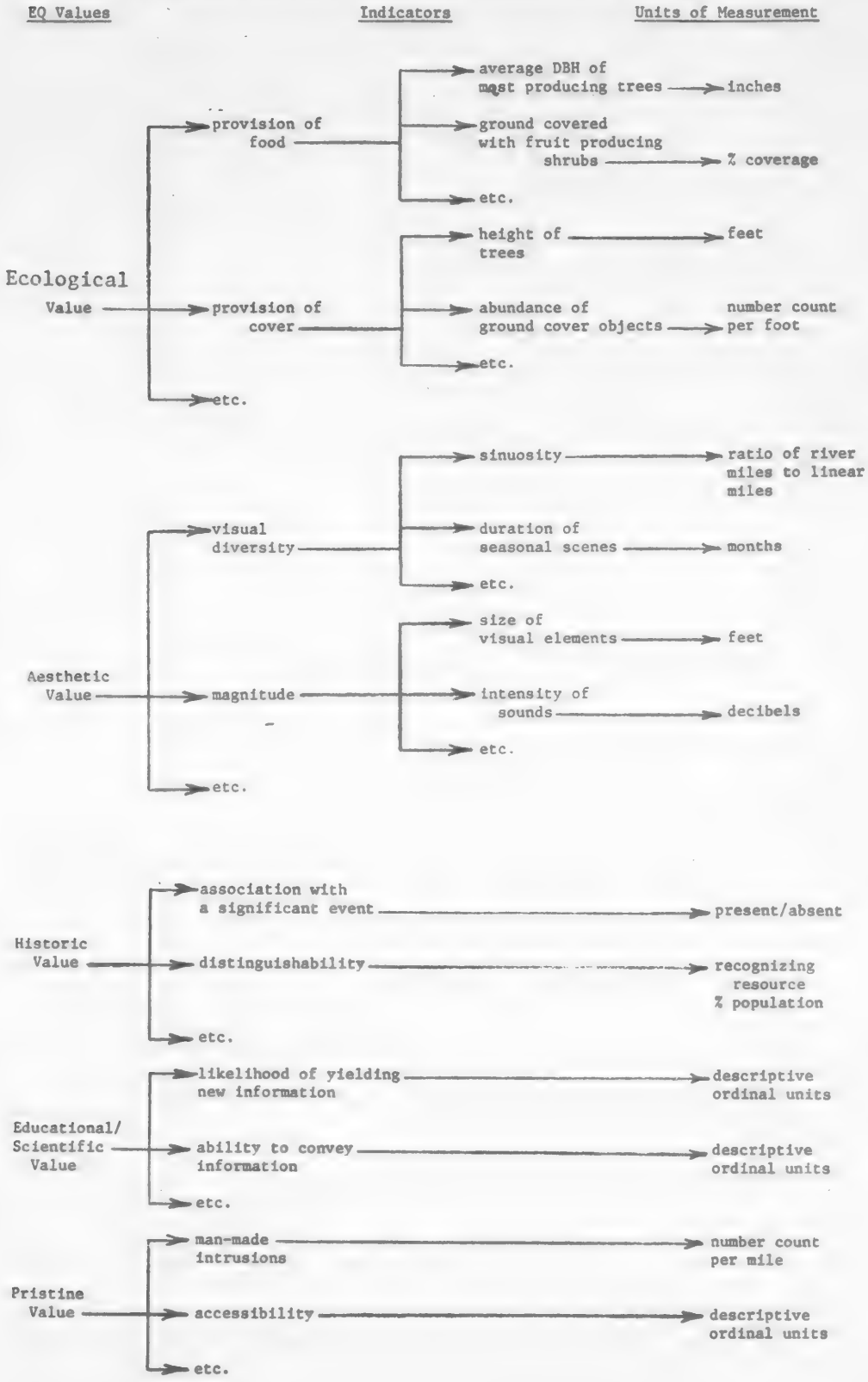
(7) It is the responsibility of the agency (including the lead planning agency), group, or individual that identifies the resource to provide documented evidence that the resource meets the criteria in § 714.410(a)(3). An agency decisionmaker may reject inclusion of a resource if, in his or her judgment, the evidence does not reasonably demonstrate that a resource meets the criteria in § 714.410(a)(3). Reasons for such rejections are to be recorded. Agencies may use other procedures in addition to the scoping process to identify EQ resources, provided that such procedures also produce the required evidence.

(d) *Develop measurement framework.* (1) This activity is performed to identify the specific quantity and quality measurements for each EQ resource identified in the previous activity. Identified measurements will guide data collection in the following phase of EQ evaluation.

(2) The quantity of an EQ resource is to be measured in terms of a physical dimension. For each EQ resource, an indicator, unit of measurement, and guideline are to be selected for quantity measurement. If the amount of a resource is not a relevant measurement, a simple measurement of "presence" may be used. Column 5 of Table 714.410–1 lists the quantity indicators, units, and guidelines to be used for specific types of resources. For other EQ resources, indicators and units are to be selected based on the professional judgment of planners with expertise relevant to each resource, and guidelines are to be derived based on the source of institutional, public, or technical recognition used to justify the resource's significance.

(3) The quality of an EQ resource is to be measured in terms of its ecological, aesthetic, historic, educational/scientific, and pristine values. For each EQ value provided by a resource, one or more indicators are to be selected for measurement or estimation of EQ value changes. For each indicator, a method of measurement and a guideline are to be selected. Indicators and methods of measurement are to be selected based on the professional judgment of planners with expertise relevant to each resource and value. Indicators may provide a direct measure of value or a means of estimating value. For example, the ecological value of an aquatic habitat could be measured directly in terms of habitat units, or its value could be estimated based on the change in pertinent water chemistry parameters. Methods of measurement include but are not limited to habitat-based assessment methodologies for determining ecological values, visual resource rating methodologies for determining aesthetic values, and professional judgment for determining historic, educational/scientific, and pristine values. In selecting guidelines, first preference is to be given to legally established guidelines, such as "minimal accessibility" for a designated scenic river. If there are no legally established guidelines, guidelines for resources or indicators measuring ecological, historic, and educational/scientific values will be based on the professional judgment of planners with expertise relevant to those values; and guidelines for resources or indicators measuring aesthetic and pristine values will be based on public preferences as determined by planners. See Table 714.410–2 for examples of indicators and units for measuring EQ values.

Table 714.410-2 Examples of Indicators and Units of Measurement for EQ Value



Note.—These examples are for illustration purposes only and are not to be interpreted as required or limiting.

(4) Quantity and quality indicators and guidelines are to be identified in accordance with the scoping process required by NEPA regulations (40 CFR 1501.7) using the expertise of cooperating agencies (40 CFR 1501.6) and the preferences of public interests as appropriate. Indicators, units, and guidelines may be changed as necessary for each evaluation situation.

(5) The measurement framework for each EQ evaluation is to be documented in accordance with the format shown in Table 714.410–3.

§ 714.420 Inventory resources.

Inventorying is performed to collect and develop data, within the previously defined resource and measurement limits, for use in assessing the effects of alternative plans on EQ resources. In the first inventorying activity, data for past and existing conditions of identified EQ resources are collected. In the second and third activities, future without-plans and with-plan conditions are estimated. The three inventorying activities are discussed in detail in this section.

(a) *Survey existing conditions.* (1) This activity is performed to collect data that describe the trend and existing conditions of EQ resources. The trend condition is the recorded historic description of a resource. The existing condition is the most recent description of a resource, i.e., as it existed at the latest date of the trend condition. Trend and existing conditions of EQ resources are to be described in terms of the quantity and quality indicators selected in the previous activity.

Table 714.410-3
Format for Measurement Framework

EQ Resource	Quantity/ Quality	Indicators	Units	Guidelines
(list study area EQ resources, as identified in accordance with Section 714.410 (a)).	Quantity	(List a quantity indicator for each EQ resource, as identified in accordance with Section 714.410(b).)	(List a unit of measurement for each quantity indicator, as identified in accordance with Section 714.410 (b).)	(List a guideline for each quantity indicator, as identified in accordance with Section 714. 410(b).)
	Quality (List the EQ values attributed to each listed EQ resource: Ecological, Aesthetic, Historic Educational/ Scientific, Pristine, as identified in accordance with Section 714. 410(a).)	(List one or more quality indicators for each listed EQ value, as identified in accordance with Section 714.410(b).)	(List a unit of measurement for each quality indicator, as identified in accordance with Section 714.410(b).)	List a guideline for each quality indicator, as identified in accordance with Section 714.410(b).)
Example Harrison Farm- "Old Field"	Quantitv	Area	Acres	500 acres (preserve existing acreage, or create additional area).
	Ecological Value	Carrying Capacity	Habitat Suitability Index (HSI)	0.7 (preserve existing HSI, or increase it by better management).
	Aesthetic Value	Visual Diversity	0-10 Scale (criteria) for scale	6 (preservation or enhancement visual diversity).
	Historic Value	Sense of Association with signing of 1783 treaty.	Narrative description.	Preservation of existing condition, or restoration of conditions to approach 1783 condition.

(2) The description of trend and existing conditions of EQ resources is to be undertaken in Step 2, Inventory Planning Setting, of the planning process. During early planning, available trend and existing condition data is to be collected for each EQ resource. Predictions about the likely occurrence of other EQ resources should be developed, based on the available data, as a guide to later data collection.

(3) If existing condition data is out of date, invalid, or unavailable, a data collection program is to be developed to provide current data. Data collection programs are to require the use of professionals and expertise relevant to each EQ resource for developing and analyzing data, in accordance with the NEPA regulations' cooperating agencies (40 CFR 1501.6) and scoping (40 CFR 1501.7) requirements. Data collection programs are to be initiated early enough such that required data is available when needed for evaluation. The EQ data base is to be reviewed during each stage of evaluation to progressively focus it at the proper level of detail necessary for evaluation.

(4) Agencies are to insure the professional integrity, including scientific integrity, of the methodologies and analyses used in data collection programs as required by the NEPA regulations (40 CFR 1502.24).

(b) *Forecast without-plans conditions.* (1) This activity is performed to develop data that describe the future conditions of EQ resources in the absence of any of the alternative plans under consideration. Without-plans conditions are to be described for EQ resources in terms of the same quantity and quality indicators used to inventory data on past and existing conditions.

(2) The without-plans condition is an estimation of the most probable future condition of an EQ resource in the absence of any of the study's alternative plans. The without-plans condition includes any changes expected to directly or indirectly result from all reasonably foreseeable actions without any of the study's alternative plans. For example, if it is reasonably certain that within the next 20 years 60 percent of the study area's woodlands will be cleared for agricultural purposes without a Federal plan, the effects of such clearing will be included in the without-plans condition. Or if existing legislation, such as the Clean Water Act, is expected to improve conditions in the study area, such improvements are to be included in the without-plans conditions. A without-plans condition may be expressed in a series of data for several specified future dates, or as a data average over the period of analysis.

(3) Without-plans conditions are to be based on:

(i) Trend and existing conditions data;

(ii) Other available related forecasts (for example, local and use plans, population projections);

(iii) Established institutional objectives and constraints, and customs and traditions related to the resource (for example, State historic preservation plans, management goals for wildlife regfugees, local agricultural practices); and

(iv) The effects of all reasonably foreseeable actions expected to occur in the absence of any of the study's alternative plans (for example, the effects described in other planning reports, Final Environmental Impact Statements, etc.).

(4) Approaches for estimating without-plans conditions will vary by EQ resource; EQ value; study area; availability of expertise, time, and money, and other factors. In addition, individual forecasting approaches are not mutually exclusive and may be used in various combinations to accommodate specific study needs. Therefore, while there is no one approach, or combination of approaches, that can be mandated for all circumstances, several general forecasting approaches should be considered. These include:

(i) Adoption of available forecasts developed by other sources;

(ii) Use of scenarios to describe hypothetical futures and the likely sequences of events that might lead to those futures;

(iii) Use of expert judgment techniques, such as Delphi and nominal group, in which the views of relevant professionals are systematically elicited and analyzed; and,

(iv) Use of extrapolation techniques, such as trend analysis and simple modeling, which rely on historic trend data to describe the future.

(5) EQ forecasts should attempt to cover the entire period of analysis, unless so doing would be unrealistic or unreasonable. If it is not realistic or reasonable to estimate future conditions over the entire period of analysis, planners are to develop a forecast of the longest possible duration and give their reasons for not estimating to the end of the period. Conversely, the period of analysis is not to constrain longer-term forecasts if they can be realistically and reasonably made and if they are needed to describe irreversible or irretrievable commitments of resources, or the relationship of short-term uses of man's environment to long-term productivity.

(c) *Forecast with-plan conditions.* (1) This activity is performed to develop data that describes the future conditions of EQ resources under each of the alternative plans being considered. With-plan conditions are to be described for each alterntive plan in terms of the affected EQ resource, using the same quantity and quality indicators used in the previous activity.

(2) The with-plan condition is an estimation of the most probable future condition of an EQ resource expected to occur as a result of implementation of a specific alternative plan formulated during the study. It is a forecast that starts at the date of plan implementation and ends on the last date of the period of analysis. It includes changes likely to directly or indirectly result both from the plan and from all reasonably foreseeable actions that are not part of the plan.

(3) The bases for estimating with-plan conditions include those used in forecasting without-plans conditions: trend and existing conditions, related forecasts, institutional objectives and constraints, and effects of other actions. In addition, a with-plan condition is to be based on the known effects of comparable past actions on the same or similar resources. (A considerable body of information has been developed on the known effects of existing water resources projects, many of which do not include programs to monitor and record ongoing effects.) Approaches for forecasting with-plan conditions include scenario writing, expert judgment techniques, and comparative analysis.

§ 714.430 Assess effects.

Assessment is performed to identify and describe the effects of alternative plans on EQ resources. In the first activity, the without-plans conditions and with-plan conditions are compared for each resource in terms of the quantity and quality indicators, to identify effects. Where differences are identified, the nature of the difference is described in the next activity. These activies are described in detail in this section.

(a) *Compare without-plans conditions to with-plan conditions.* (1) This activity is performed to identify the effects of alternative plans on EQ resources. It requires a comparison between the without-plans and with-plan conditions for each resource in terms of quantity and quality indicators. An effect is indicated whenever without-plans and with-plan conditions are different.

(2) If two or more quality indicators are forecast for a given EQ resource the without-plans and with-plan conditions must be compared for each indicator to determine whether all forecast estimates show the same type of effect. For

example, if the ecological value of the resource "oak-pine habitat in the Upper Pauleysmum River Basin" is being measured in terms of the indicator "carrying capacity," forecasts for several additional indicators related to "carrying capacity" may have been developed (for example "percent herbaceous ground cover," "relative abundance of fruit-producing understory," "average DBH of mast producing trees," etc., as relative to various species). In this case, the effects on each of the additional indicators must be analyzed to determine how each relates to the main indicator, "carrying capacity," in order to determine the effect in terms of that indicator.

(3) Once an effect is identified, it is to be described in the next activity in EQ evaluation. If no effect is identified (i.e., the without-plans and with-plan conditions for a give EQ resource are equal), the unaffected EQ resource is to be dropped from further analysis, except for EQ resources listed in column 1 of Table 714.410–1, which are to be identified by "no effect" in the display required by § 714.440(a)(4).

(b) *Describe effects.* (1) This activity is performed to describe each effect on an EQ resource identified in the previous activity. The description is to be undertaken in two steps. In the first step, effects are to be described in terms of their location, duration, and magnitude.

(i) Location is the place where an effect is expected to occur. It is to be described in terms of an identifiable geographic location, such as "between river miles 57 and 63." The location of an effect should be described as specifically as possible without revealing the location of sensitive resources such as archaeological sites and endangered species habitats that could be jeopardized by wide distribution of location information.

(ii) Duration is the length of time over which an effect is expected to occur. It is to be described in terms of a duration period beginning at a specific time, such as "20 years beginning in 1990." The duration of most effects will be confined to a span of time within the period of analysis. However, some perpetual effects, such as the loss of a distinctive landform, may exceed the final date of the period of analysis.

(iii) Magnitude is the measurable difference between without-plans and with-plan conditions.

(A) If an EQ resource or indicator is measured in cardinal units (that is, it can be added, subtracted, multiplied, and divided), magnitude is to be expressed as the numeric difference between the without-plans and with-plan conditions. If a measurement unit is based on some other type of scale, such an ordinal scale of "great diversity, moderate diversity, low diversity," magnitude is to be expressed in either a numeric or narrative form suitable for accurately describing the difference.

(B) Magnitude is to be expressed as a series of data over time, such as "−400 acres in 1990, −200 acres in 2000, −150 acres in 2010," or as a datum average over the effect's duration, such as "−175 acres, 1990–2040." The time at which, or the period over which, an identified magnitude is expected to occur will always be noted.

(iv) Other characteristics of effects may be described where their description is relevant and useful to decisionmaking.

(2) In the second step, the significance of each effect is to be determined based on the criteria prescribed in the NEPA regulations (40 CFR 1508.27), which are as follows:

"Significantly as used in NEPA requires considerations of both context and intensity:

"(a) Context. This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests and the locality. Significance varies with the setting of the proposed action. For instance, in the case of site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short and long term effects are relevant.

"(b) Intensity. This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of major action. The following should be considered in evaluating intensity:

"(1) Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.

"(2) The degree to which the proposed action affects public health or safety.

"(3) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

"(4) The degree to which the effects on the quality of the human environment are likely to be highly controversial.

"(5) The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

"(6) The degree to which the action may establish a precedent for future actions with significant effects, or represents a decision in principle about a future consideration.

"(7) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

"(8) The degree to which the action may adversely affect districts, sites, buildings, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

"(9) The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

"(10) Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment."

(3) Effects that are determined to be significant, whether beneficial or adverse, are to be appraised in the next phase of EQ evaluation. Effects that are not determined to be significant are to be dropped from further analysis, except that effects on the resources listed in column 1 of Table 714.410–1 are to be appraised in the next phase of EQ evaluation whether or not these effects are determined to be significant.

§ 714.440 Appraise effects.

Appraisal is performed to identify the desirability of significant effects on EQ resources, individually and collectively, for each alternative plan. In the first activity, significant effects are to be appraised as either "beneficial" or "adverse." All significant effects and the resources affected are then to be displayed for each alternative plan. In the next activity, the desirability of each alternative plan's overall net effect on EQ will be appraised. The overall effect of each plan will be judged as "net beneficial," "net adverse," or "no net effect." These appraisal activities are described in this section.

(a) *Appraise significant effects.* (1) This activity is performed to identify the desirability of each alternative plan's individual significant effects on EQ resources. The desirability of effects is to be described as either "beneficial" or "adverse" based on the following definitions:

(i) An effect is beneficial if, for a given EQ resource the withplan condition more closely approaches or attains the guideline than its without-plans condition. Example: the Julian City archaeological site has been identified as an EQ resource with historic value, its quality indicator is "sense of association with a significant event," and its guideline is "preservation of the site's sense of association." If the site's without-plans condition shows that the association would be lost as a result of planned residential development, but its with-plan condition for Plan X shows that the association would be preserved as a result of Federal land acquisition

included in the plan, the effect of Plan X would be classified as beneficial.

(ii) An effect is adverse if, for a given EQ resource the without-plans condition more closely approaches or attains the guideline than its with-plan condition. Example: the Gradey Swamp habitat, with a guideline of "habitat suitability index of 1.0" for its ecological value, is identified as an EQ resource. An adverse effect would occur if the habitat's without-plans condition showed a habitat suitability index of 0.7 and its with-plan condition for Plan X showed a habitat suitability index of 0.5.

(2) The effect on the physical dimension of each EQ resource is to be appraised by comparing the without-plans condition, the with-plan condition, and the guideline.

(3) The effect on the ecological, aesthetic, historic, educational/scientific, and pristine values of each EQ resource is to be appraised by comparing the without-plans condition, with-plan condition, and the guideline for each of the resource's EQ values. In addition, appraisal of an effect on an EQ value of a resource is to include consideration of the effect, if any, on the resource's physical dimension, and the relationship of the physical (quantitative) effect to the EQ value (qualitative) effect. For example, the acreage of a particular habitat may be beneficially increased with an alternative plan, but the habitat's ecological value could be adversely affected by human activities, such as recreation, attracted to the area. But, an improvement in the ecological value of a habitat would not necessarily be benefical unless an adequate amount of habitat would be available. Thus, changes in both quantitative physical dimensions and qualitative values must be considered to fully interpret and appraise effects on EQ values.

(4) Appraised effects are to be displayed in tables developed in accordance with the format illustrated in Table 714.440. A table is to be prepared for each alternative plan. The display will be provided to the agency decisionmaker for judgment of net EQ effects.

(b) *Judge net EQ effects.* (1) This activity is performed to describe the desirability of the overall or net EQ effect of each alternative plan. Net effect is to be described as "net beneficial EQ effect," "net adverse EQ effect," or "no net EQ effect" based on the following definitions:

(i) A net beneficial EQ effect occurs when, in the judgment of the agency decisionmaker, an alternative plan's combined beneficial effects on EQ resources outweigh the plan's combined adverse effects on EQ resources.

(ii) A net adverse EQ effect occurs when, in the judgment of the agency decisionmaker, an alternative plan's combined adverse effects on EQ resources outweigh the plan's combined beneficial effects on EQ resources.

(iii) No net EQ effect occurs when, in the judgment of the agency decisionmaker, an alternative plan's combined beneficial and adverse effects on EQ resources are equal.

Table 714.440.—*Format for Appraisal of Alternative Plans*

SIGNIFICANTLY AFFECTED EQ RESOURCES	QUANTITY EFFECTS		QUALITY EFFECTS									
			Ecological Value		Aesthetic Value		Historic Value		Educational/Scientific Value		Pristine Value	
	Assessment	Appraisal	Assessment	Appraisal	Assessment	Appraisal	Assessment	Appraisal	Assessment	Appraisal	Assessment	Appraisal
(List each significantly affected EQ resource, as identified in accordance with Section 714.430(b).).	(Describe the location, duration, magnitude, and reasons for significance of each effect on the quantity of each listed EQ resource, as identified in accordance with Section 714.430(b).).	(State whether each effect on the quantity of each listed EQ resource is beneficial or adverse and the reason(s) that supports the stated appraisal, as identified in accordance with Section 714.440(a).).	(Describe the location, duration, magnitude and reasons for significance of each change in the ecological value of each listed EQ resource, as identified in accordance with Section 714.440(a).).	(State whether each change in the ecological value of each listed EQ resource is beneficial or adverse and the reason(s) that supports the stated appraisal, as identified in accordance with Section 714.440(a).).	(Same as for ecological value.)	(Same as for ecological value.)	(Same as for ecological value.)	(Same as for ecological value.)	(Same as for ecological value.)	(Same as for ecological value.).	(Same as for ecological value.)	(Same as for ecological value.)
Example ..... Harrisoni Farm old field.	-400 acres in NW quadrant during reservoir filling (1990); significant based on cumulative effect.	adverse; failure to preserve existing acreage.	-750 habitat units annually over the period of analysis (1990–2040) in NW quadrant; significant based on cumulative effect.	adverse; failure to preserve or enhance existing carrying capacity.	+3 visual diversity units in NW quadrant over the period of analysis (1990–2040); significant based on proximity to State Park.	beneficial; visual diversity improved.	loss of association with Treaty signing at signing site over the period of analysis (1990–2040); significant based on NRHP designation of site.	adverse; sense of association with Treaty signing event destroyed.	not applicable.	not applicable.	not applicable.	not applicable.

(2) The agency decisionmaker is responsible for judging which of these types of net EQ effects best reflects the desirability of an alternative plan's overall effect on environmental quality. This judgment is to be based on a thorough consideration of all significant effects on EQ resources. In making a judgment on the EQ effect, the agency decisionmaker is acting on behalf of the public and must therefore consider public views related to the judgment. The decisionmaker may change a judgment on the net EQ effect of an alternative plan based on a reevaluation of existing information, or whenever relevant new information is brought to his or her attention. Reasons for the change are to be properly documented.

(3) Planners are to assist agency decisionmakers by presenting information bearing on the judgment of net EQ effect in a manner that aids the judgment process. As a minimum, the tables used to document the Appraise Significant Effects activity, as illustrated in Table 714.440, are to be provided to the decisionmaker prior to judgments on net EQ effect.

(4) The net EQ effect of each alternative plan is to be expressed in a clear and complete narrative statement that identifies the type of net EQ effect expected and, as specifically as practicable, the reasons that provided the basis for the judgment.

5. By adding a new Part 716 to read as follows:

PART 716—PROCEDURES FOR EVALUATION OF OTHER SOCIAL EFFECTS (OSE) IN WATER RESOURCES PLANNING (LEVEL C)

Subpart A—Purpose

Sec.

716.1 Authority and relationship to the principles and standards.
716.3 Agency activities covered by the Manual.
716.5 Responsibility for application of the Manual.
716.7 Schedule for application of the Manual.
716.9 Modification of the Manual.

Subpart B–D—(Reserved).

Subpart E—OSE Evaluation Procedures: Dam Failure

716.301 Introduction.
716.303 Conceptual basis.
716.305 Planning setting.
716.307 Evaluation procedures.
716.309 Report and display procedures.

Authority: 42 U.S.C. 1962d–1.

Supart A—Purpose

§ 716.1 Authority and relationship to the principles and standards.

On July 12, 1978, President Carter directed the Water Resources Council (WRC) and its Member agencies to "carry out a thorough evaluation of current agency practices for making benefit and cost calculations" and "publish a planning manual that will ensure that benefits and cost are estimated using the best current techniques and calculated accurately, consistently and in compliance with the Principles and Standards and other applicable economic evaluation requirements." This Part of the procedures is specifically intended to supplement and implement the Standards for the evaluation and display of Other Social Effects (OSE) in water resources planning (Level C) established by the Water Resources Council pursuant to Section 103 of the Water Resources Planning Act (Pub. L. 89–80; 42 U.S.C. 1962a–2).

§ 716.3 Agency activities covered by the manual.

(a) These procedures shall be used for the evaluation and display of Other Social Effects of Federal and federally-assisted water resources projects covered in § 711.4 of the Principles and Standards for Planning Water and Related Land Resources. The procedures apply to all Level C (project) planning subject to the Principles and Standards, including (1) projects that may be approved by agency administrators, (2) projects requiring congressional authorization, and (3) authorized projects or separable features of authorized projects not yet under construction for which agencies currently prepare postauthorization planning documents. For the purposes of these procedures a project shall be considered "under construction" when funds have been appropriated by the Congress or budgeted by the President for land acquisition or physical construction activity. Projects for which postauthorization planning documents are not required shall be considered under construction when authorized for construction.

(b) The Secretaries of Departments shall retain the discretion to review those projects not under construction and may, under their discretionary authority, wholly exempt a project from complying with these procedures or partially exempt a project and direct expedited additional planning to meet specific procedures. This discretionary authority applies to those projects not yet authorized for which preauthorization planning is now complete or will be completed by the end of fiscal year 1981 and to those authorized projects requiring postauthorization planning if such planning is now complete or will be complete by the end of fiscal year 1981. For purposes of applying this Manual, preauthorization or postauthorization planning shall be considered complete when the appropriate planning documents have been approved by the responsible agency's field office. Secretarial authority to exempt projects from the procedures of this Manual is provided to prevent undue loss of time or expenditure of public funds in those cases in which the Secretary judges additional planning to be unnecessary. This discretionary authority may not be exercised after July 31, 1982.

(c) Authorized projects exempted from complying with the Principles and Standards are also exempted from complying with these procedures.

§ 716.5 Responsibility for application of the manual.

The administrator of each covered Federal or federally-assisted program is responsible for applying these procedures.

§ 716.7 Schedule for application of the manual.

The responsible agency administrators shall adopt these procedures within 30 days after the date of publication as final rules in the Federal Register.

§ 716.9 Modification of the manual.

The Water Resources Council will revise these procedures periodically as experience, research, and planning conditions dictate.

Subparts B–D (Reserved)

Subpart E—OSE Evaluation Procedures: Dam Failure

§ 716.301 Introduction.

This chapter presents the procedure to be followed for measuring and displaying the potential adverse contributions to Other Social Effects (OSE) associated with the possible failure of dams.

§ 716.303 Conceptual basis.

(a) *General.* The *Federal Guidelines for Dam Safety* prepared by the Ad Hoc Interagency Committee on Dam Safety of the Federal Coordinating Council for Science, Engineering and Technology, June 25, 1979, should minimize the risk of future dam failures, but the possibility of dam failure still exists. Current economic analyses of alternative water

resource plans do not explicitly reflect the expected social costs associated with low-probability disasters resulting from stuctural failures. The state-of-the-art of risk-based analysis does not permit precise specification of the probability of failure of individual structures. Nevertheless, potential losses can be used in the evaluation of alternative plans and in the assessment of additional safety features incorporated into dam facilities.

(b) *Types of adverse effects.* The adverse effects of dam failure include physical damage or loss; income loss; emergency costs; loss of future benefits; and loss of life, health, and safety. Each activity affected by a dam failure experiences losses in one or more of these categories. See Section 713.503 for a description of physical damages, income losses, and emergency costs.

(c) *Definition of dam or project.* As used in this section a dam or project is an artificial barrier, including appurtenant works, that impounds or diverts water and that: (1) is 25 feet or more in height from the natural bed of the stream or watercourse measured at the downstream toe of the barrier or from the lowest elevation of the outside limit of the barrier if it is not across a stream, channel, or watercourse, to the maximum water storage elevation; or (2) has an impounding capacity at maximum water storage elevation of 50 acre feet or more. These procedures do not apply to any barrier 6 feet or less in height, regardless of storage capacity, or regardless of height, to barriers with an impounding capacity at maximum water storage elevation of 15 acre feet or less. These lower size limitations should be waived if a potentially significant downstream hazard exists.

(d) The procedures apply to both dams with permanent reservoirs and detention dams used for temporary storage of floodwaters. The impounding capacity at maximum water storage elevation includes storage of floodwaters above the normal full storage elevation.

§ 716.305 Planning setting.

(a) *General.* The estimation of adverse effects that would be incurred in the event of failure of a dam shall be based on a careful analysis of the with- and without-failure conditions.

(b) *Without-failure condition.* The without-failure condition is the land use and related conditions likely to occur in the absence of dam failure. The without-failure condition corresponds closely to the condition expected to exist in the future with a given alternative plan that includes the dam being analyzed.

(c) *With-failure condition.* The with-failure condition is the most likely condition expected to exist in the future with a given dam failure. Dam failure is defined as a catastrophic failure characterized by the sudden, rapid, and uncontrolled release of impounded water. It is recognized that there can be lesser degrees of failure and that any malfunction or abnormality outside the design assumptions and parameters that adversely affect a dam's primary function of impounding water is properly considered a failure. Such lesser degrees of failure can lead to or heighten the risk of a catastrophic failure, but are normally amenable to corrective action.

§ 716.307 Evaluation procedures.

Four steps shall be completed in estimating and displaying the potential adverse effects of dam failure. The steps are designed primarily to relate land use to the hazard from an OSE perspective. The level of effort expended on each step depends on the sensitivity of alternative plan formulation to further refinement. Emphasis should be on evaluating the overall reasonableness of local land use plans (a) with respect to OBERS and other larger area data, and (b) in recognition of the hazard of dam failure.

(a) *Step 1—Delineate affected area.* The area affected consists of all areas likely to be inundated with floodwaters or affected indirectly as a result of dam failure. Maps delineating the affected area and indicating land uses and significant development or improvements shall be prepared. To assist in the evaluation of hazard potential, areas delineated on inundation maps shall be classified according to the degree of occupancy and potential for hazard.

(1) The *primary impact area* is the area in the direct path of the initial wave from the dam breach. This area is comparable in concept to the "floodway" recognized in the regulations of the National Flood Insurance Program.

(2) The secondary impact area is the area expected to be flooded primarily by rising water, where less serious damage is expected. This area is comparable in concept to the "flood fringe" recognized in the regulations of the National Flood Insurance Program.

(b) *Step 2—Determine characteristics of affected areas.* The existing and projected characteristics of the affected area shall be described. The categories of characteristics used to determine benefits from reduction of urban and rural flood damages (Sections 713.511 and 713.207 through 713.219) shall be used as a guide.

(c) *Step 3—Project activities and land use in affected areas.* The projections of activities and land use shall be consistent with the projections used to estimate benefits for the dam or project. The analyst must recognize that the areas subject to flooding in the event of dam failure are likely to be larger than those subject to recurring flooding.

(d) *Step 4—Collect land market value and related data.* The land market value and related data utilized for the affected areas shall be consistent with the data used to estimate benefits for the alternative plan containing the dam. The procedures in Section 713.525 shall be used as a guide.

§ 716.309 Report and display procedures.

The report shall include enough data to enable the reviewer to follow the key steps in the analysis.

(a) *Report procedures for risk and uncertainty.* To assist reviewers in assessing their own response to risk, the following shall be displayed.

(1) The inundation map for the flood event resulting from dam failure, including the delineation of the primary and secondary impact areas.

(2) The number of people and towns affected; the number and value of structures and acres by land-use type; description of essential services (water, power, fire protection, and sanitary services, etc.) and distance to unaffected essential services; anticipated warning time; and flood depths, velocity, duration, debris content, etc., and other indicators pertinent to catastrophic flooding.

(b) *Summary tables.* Summary Tables 716.309–1 and 716.309–2 are suggested presentations for all reports that include a dam as a measure of achieving benefits. Other summary tables may be necessary and pertinent. Other data pertinent to the evaluation shall also be presented and appropriately displayed.

Table 716.309–1.—*Number of Persons Subject to Hazards*

	Number—Time period*						
	P0	P10	P20	P30	P40	P50	P100
Primary Impact Area							
Secondary Impact Area							
Total							

* The designation P10 and P20 identify the tenth and twentieth year, respectively, of project life.

Table 716.309-2.—*Number of Acres (or Structures) Subject to Inundation*[a]

	Acres—Time period[b]						
	P0	P10	P20	P30	P40	P50	P100
PROPERTY TYPE							
Residential:							
a. (Subclassification of residential units)							
b.							
c.							
Commercial:							
Industrial:							
Agricultural:							
a. (Subclassification of agricultural uses)							
b.							
c.							
Semipublic:							
Transporation:							

[a] Tables should be displayed for the primary and secondary impact areas. Similar tables reflecting the value of these properties should also be displayed.

[b] The designations P10 and P20 identify the tenth and twentieth year respectively, of project life.

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